

Fig. 1

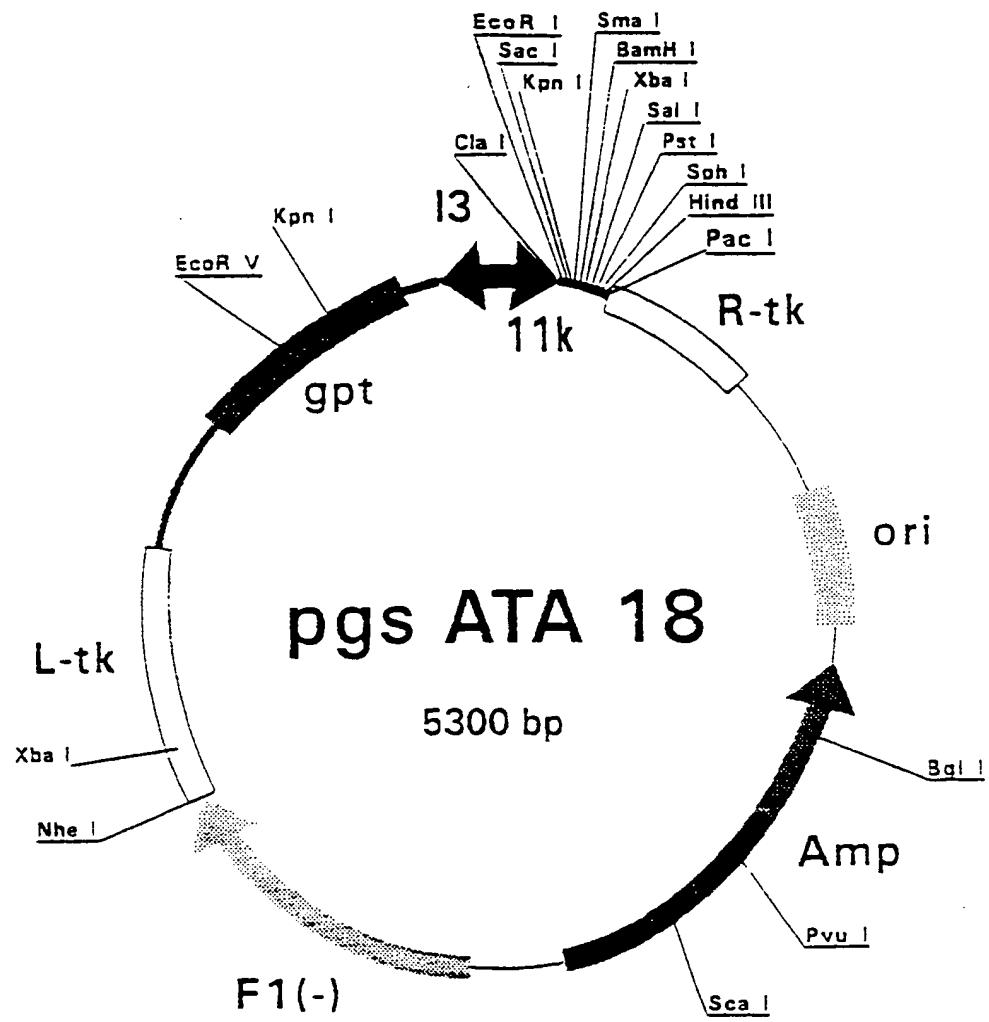


Fig. 2

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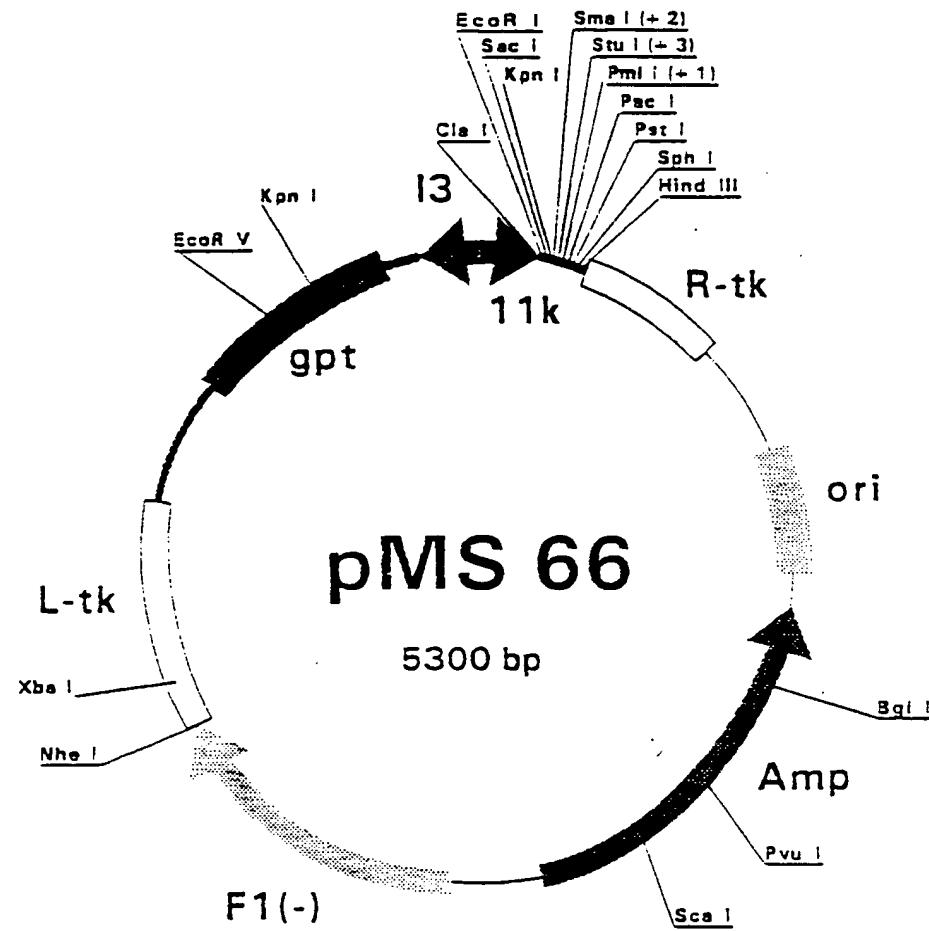


Fig. 3

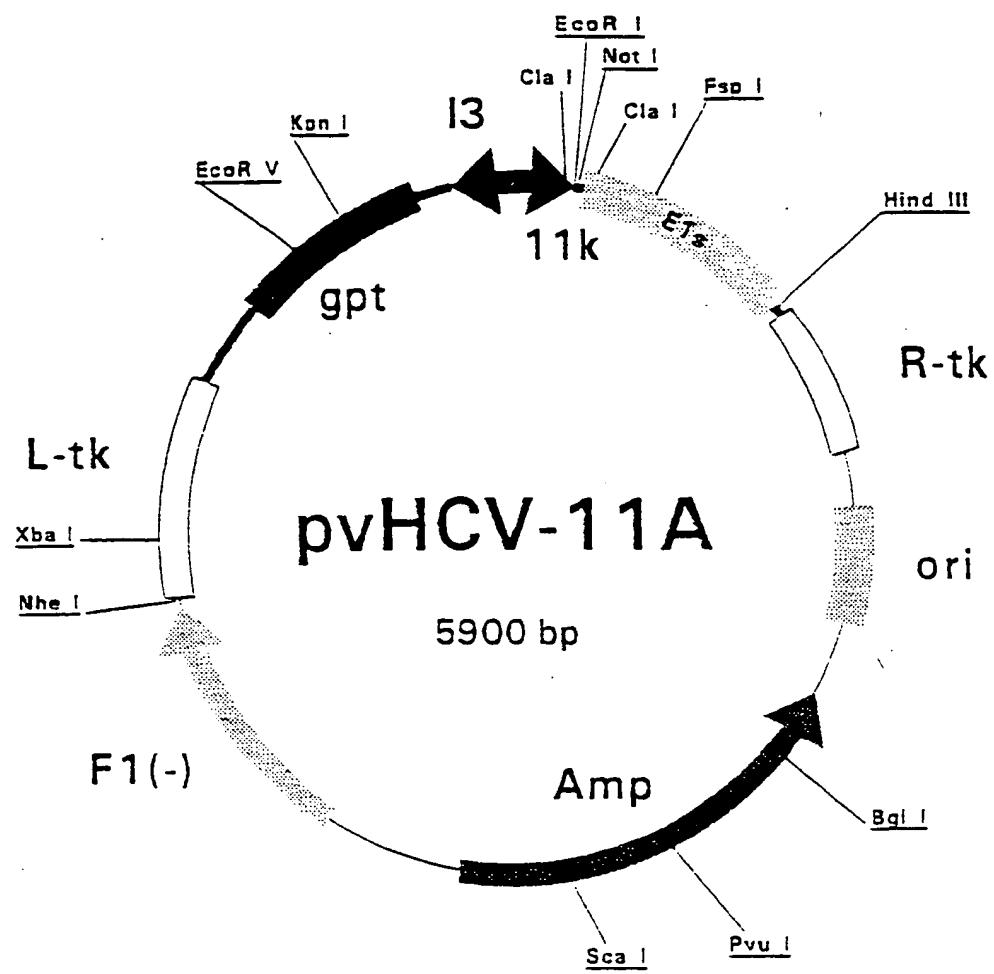
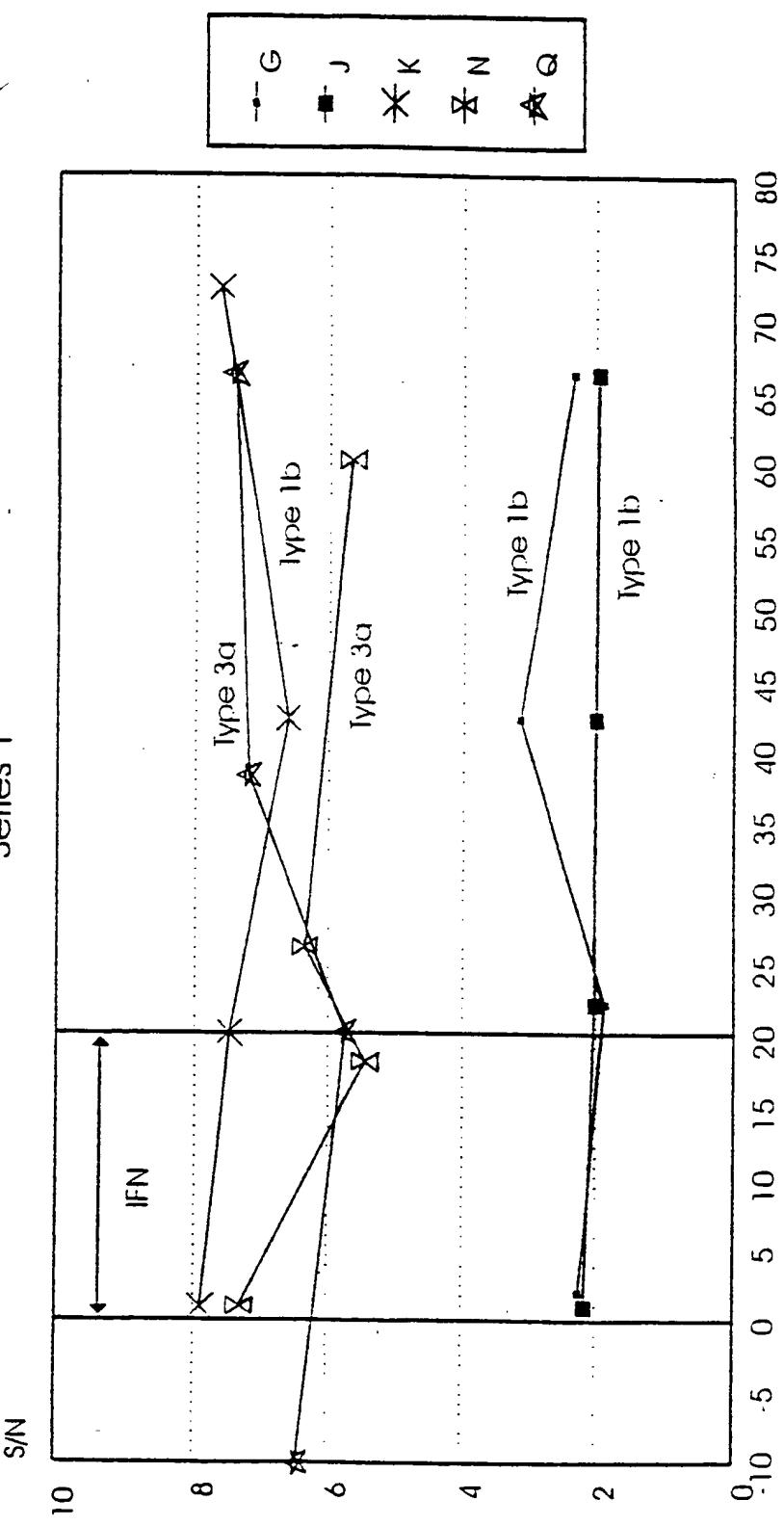


Fig. 4

Anti-E1 levels in NON-responders to IFN treatment

Series 1



weeks after start of treatment

Fig. 5

Anti-E1 levels in RESPONDERS to IFN treatment

SERIES 1

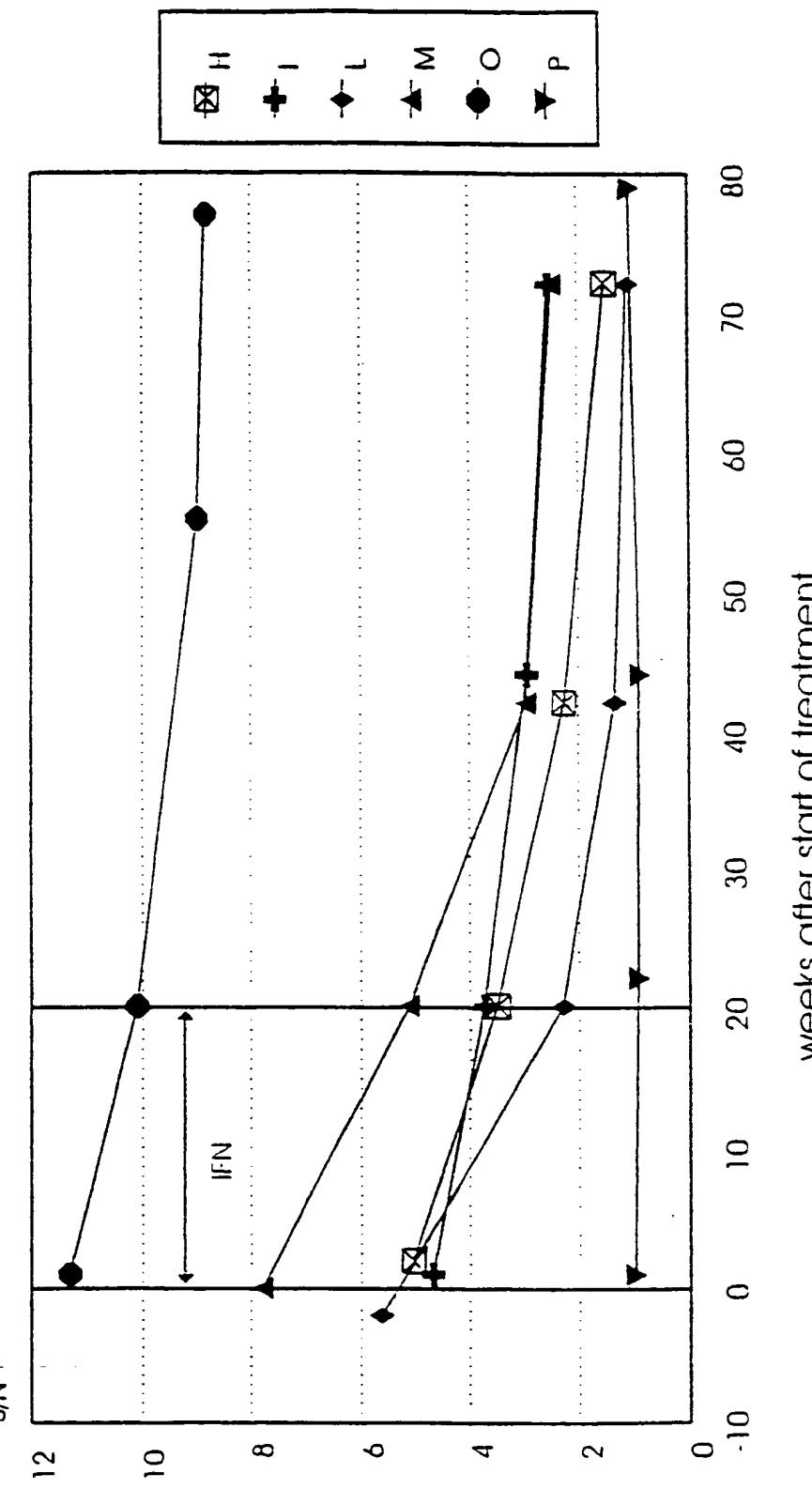


Fig. 6
weeks after start of treatment

Anti-E1 levels in patients with COMPLETE response to IFN

SERIES 2

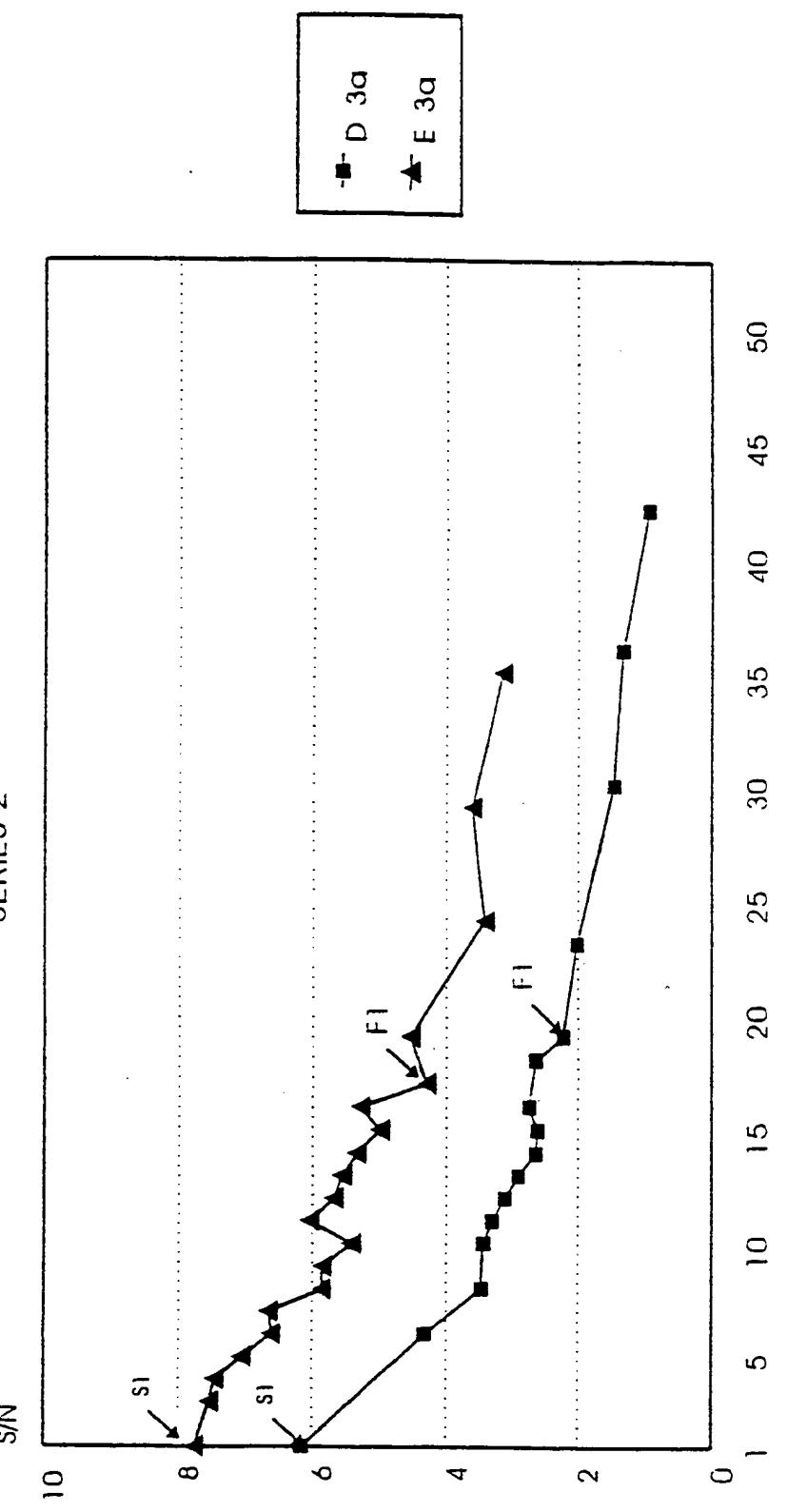
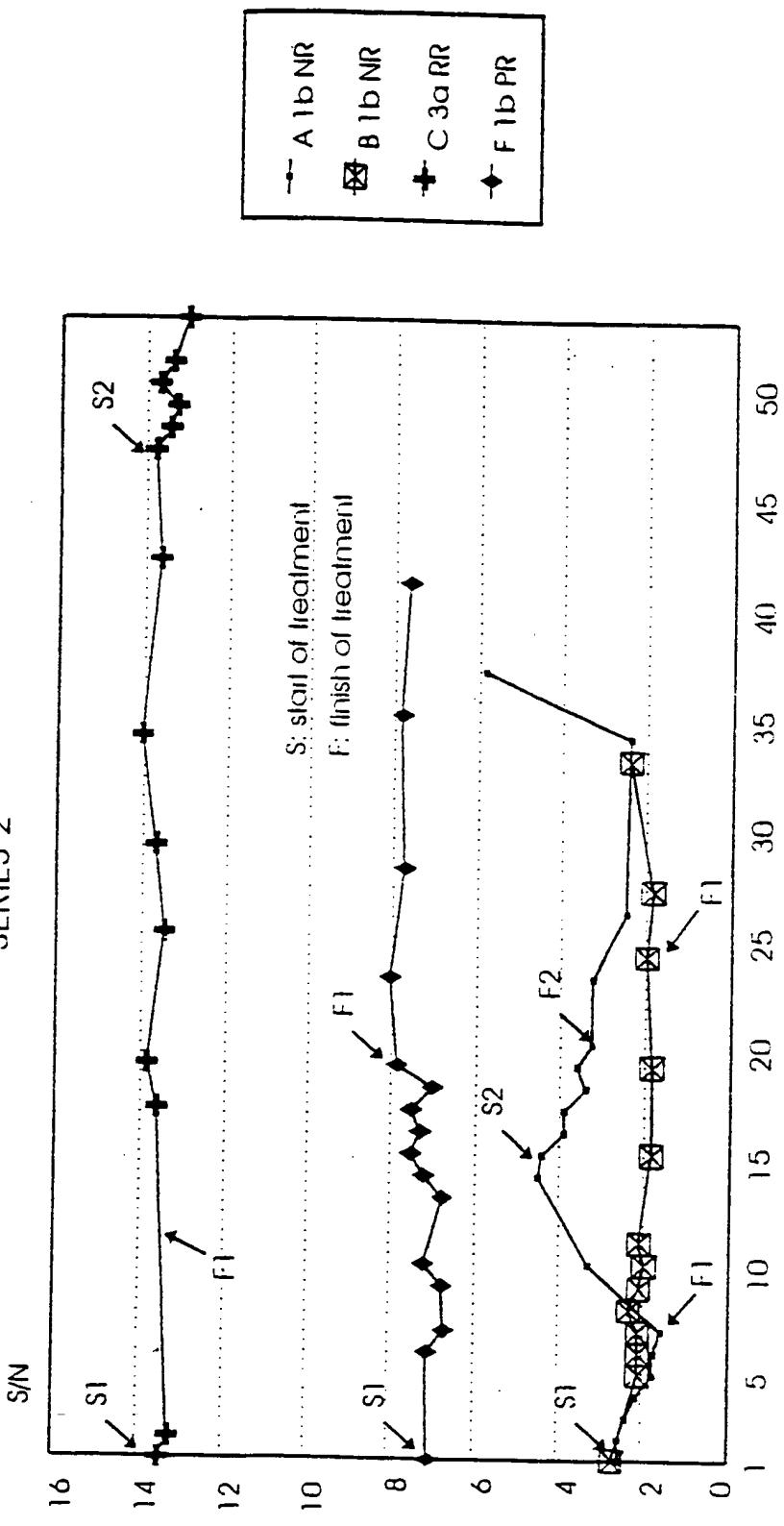


Fig. 7

Anti-E1 levels in INCOMPLETE responders to IFN treatment

SERIES 2

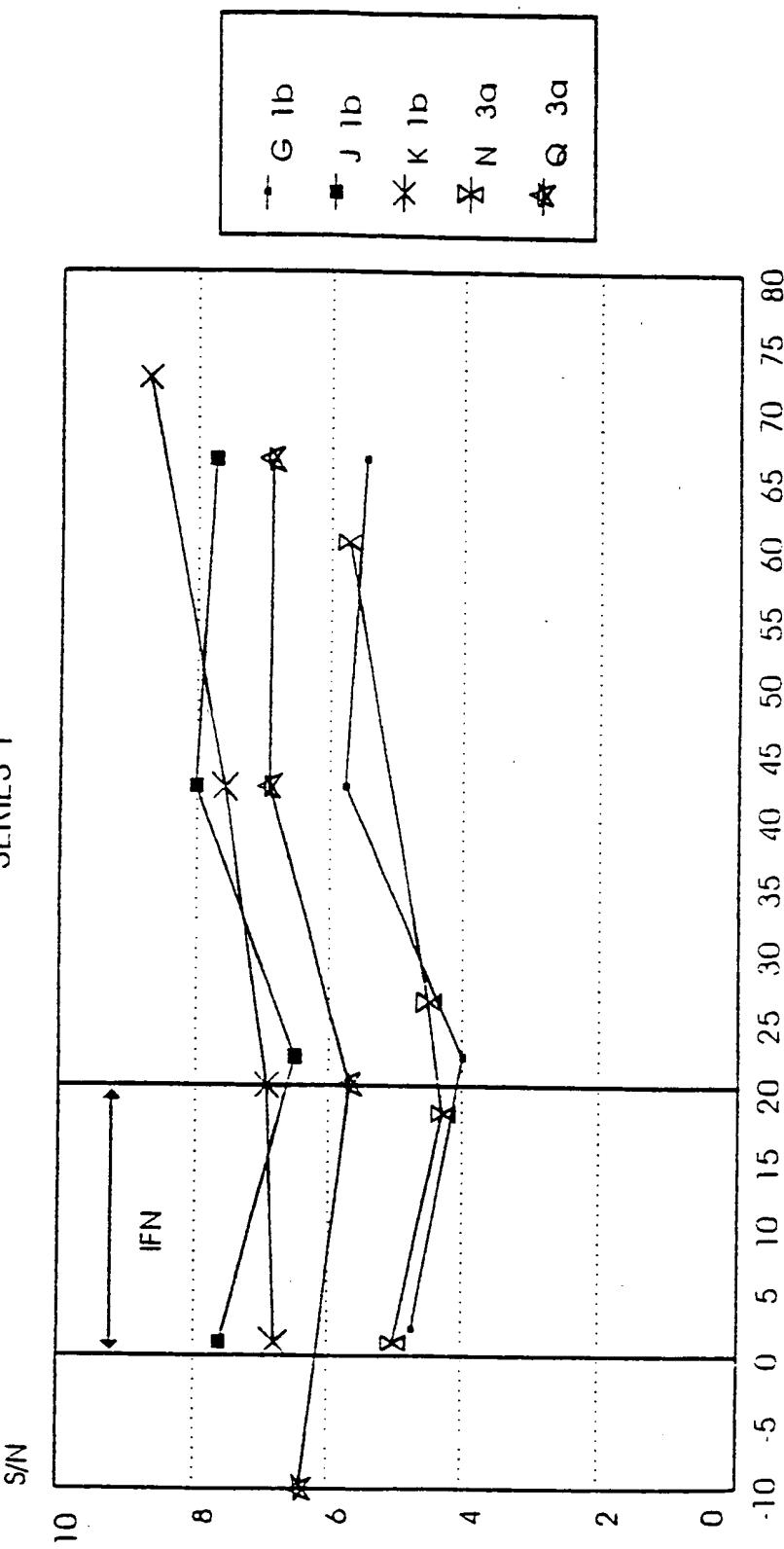


months after start of treatment

Fig. 8

Anti-E2 levels in NON-RESPONDERS to IFN treatment

SERIES 1

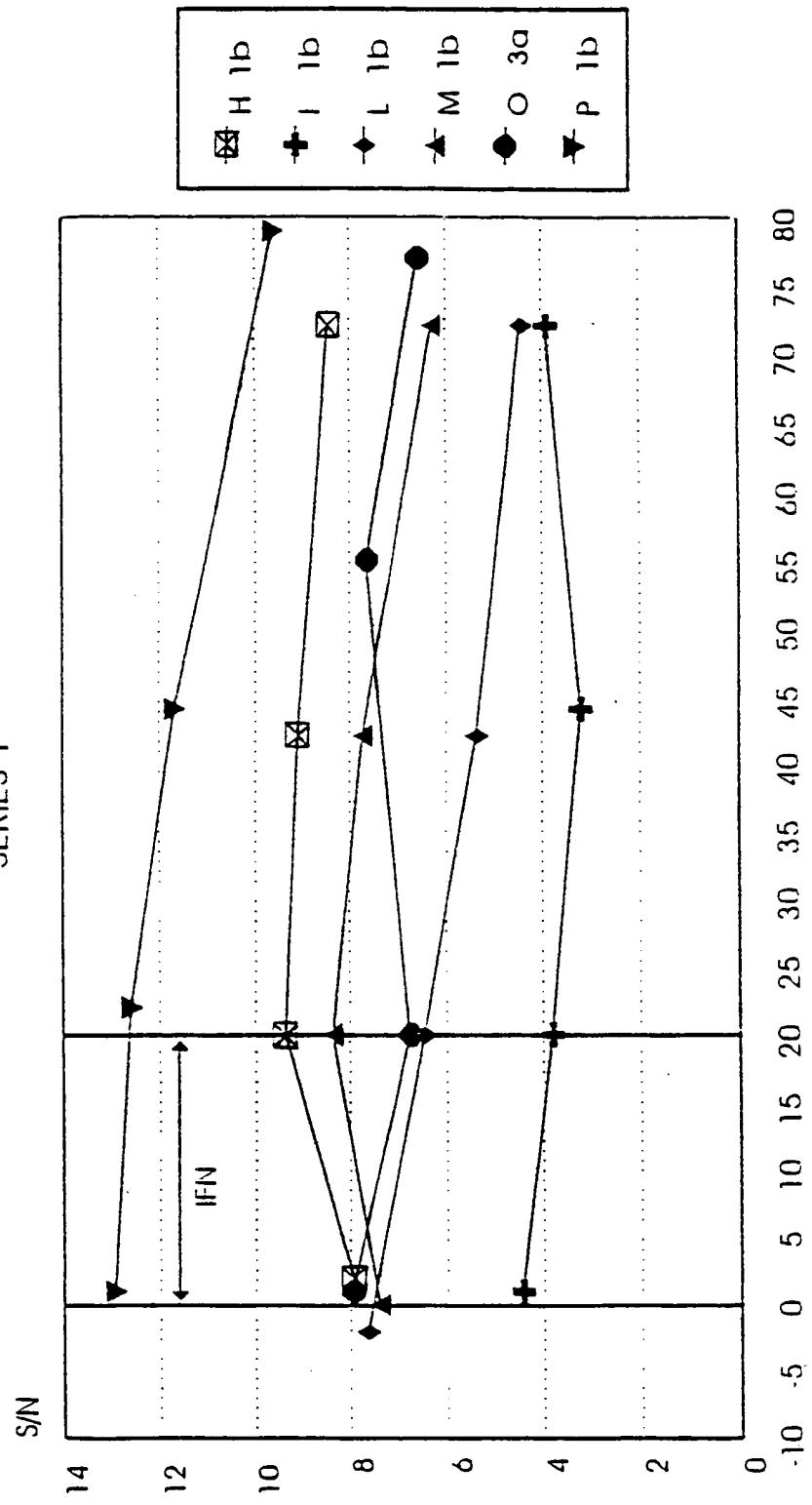


weeks after start of treatment

Fig. 9

Anti-E2 levels in RESPONDERS to IFN treatment

SERIES 1

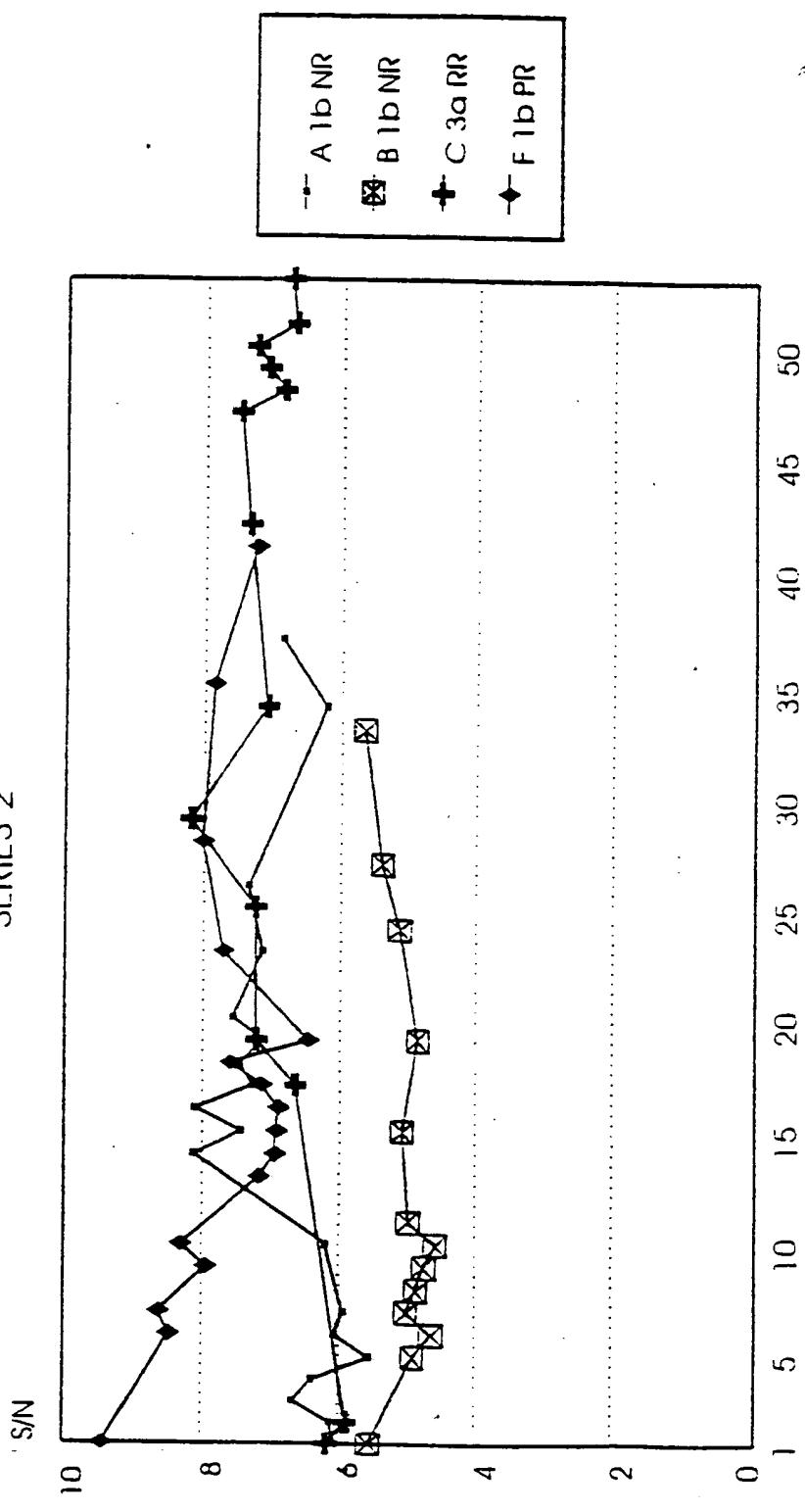


weeks after start of treatment

Fig. 10

Anti-E2 levels in INCOMPLETE responders to IFN treatment

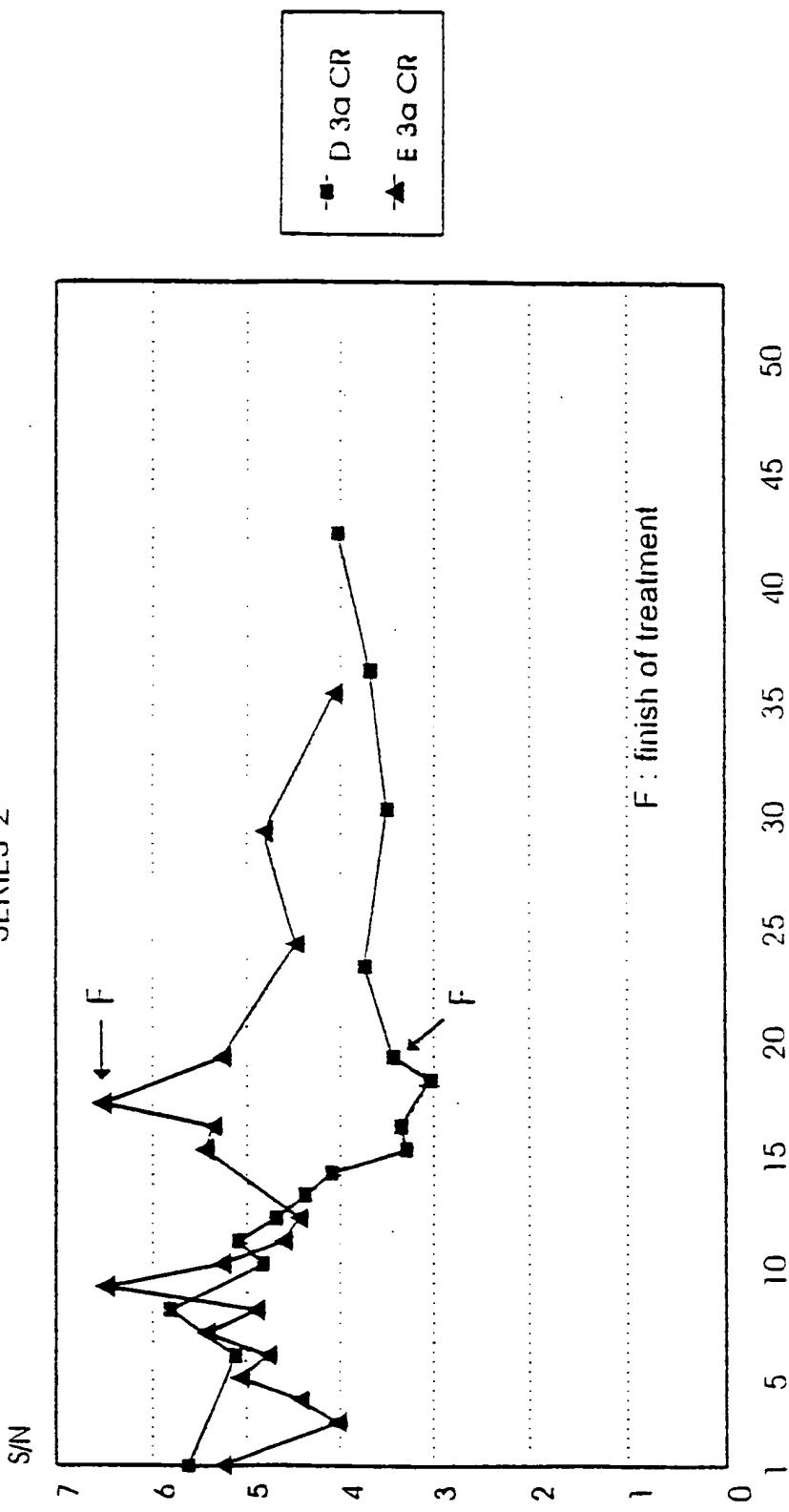
SERIES 2



months after start of treatment
Fig. 11

Anti-E2 levels in COMPLETE responders to IFN treatment

SERIES 2



months after start of treatment

Fig. 12

Human anti-E1 reactivity competed with peptides

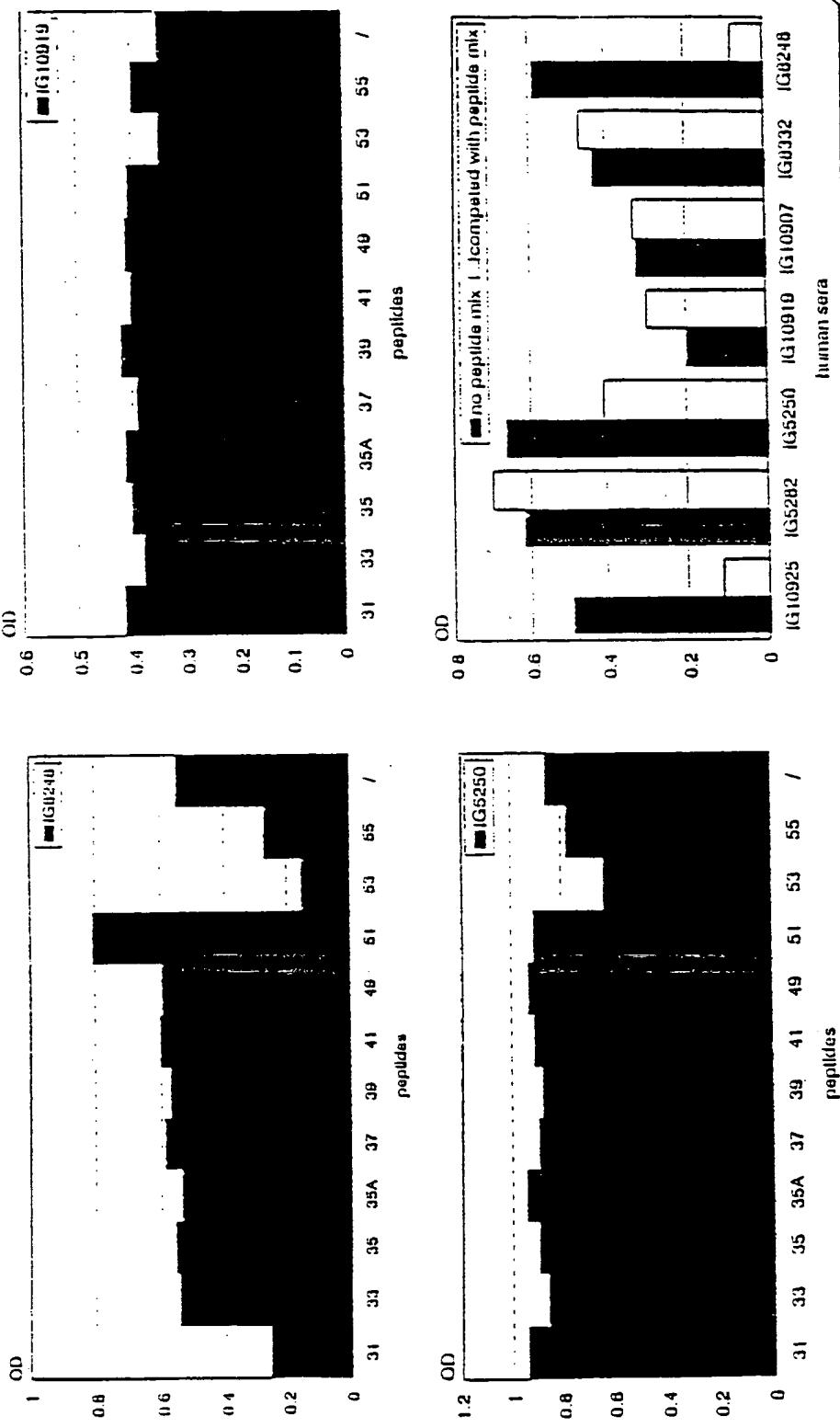


Fig.13

Competition of reactivity of anti-E1 Mabs with peptides

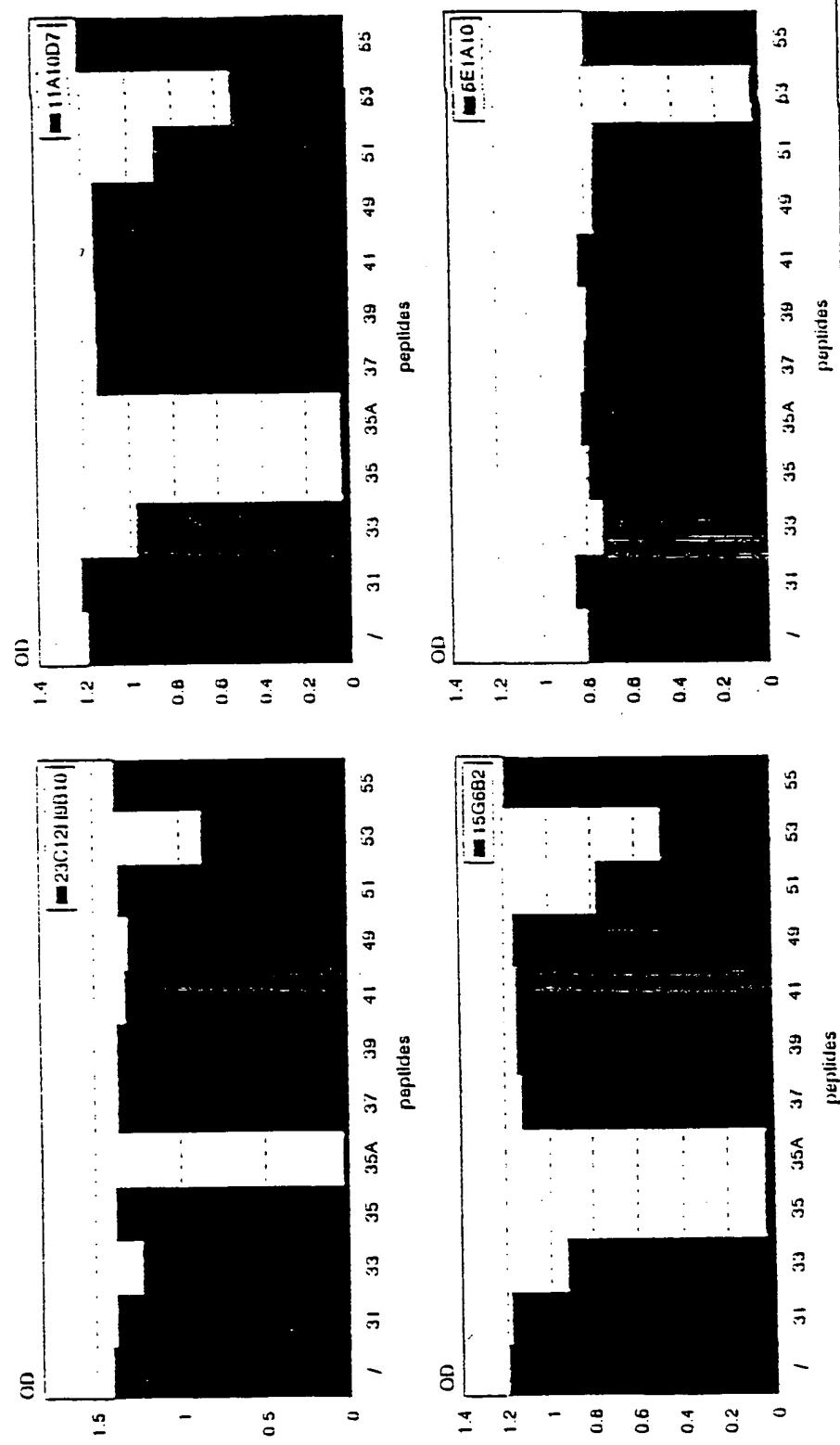
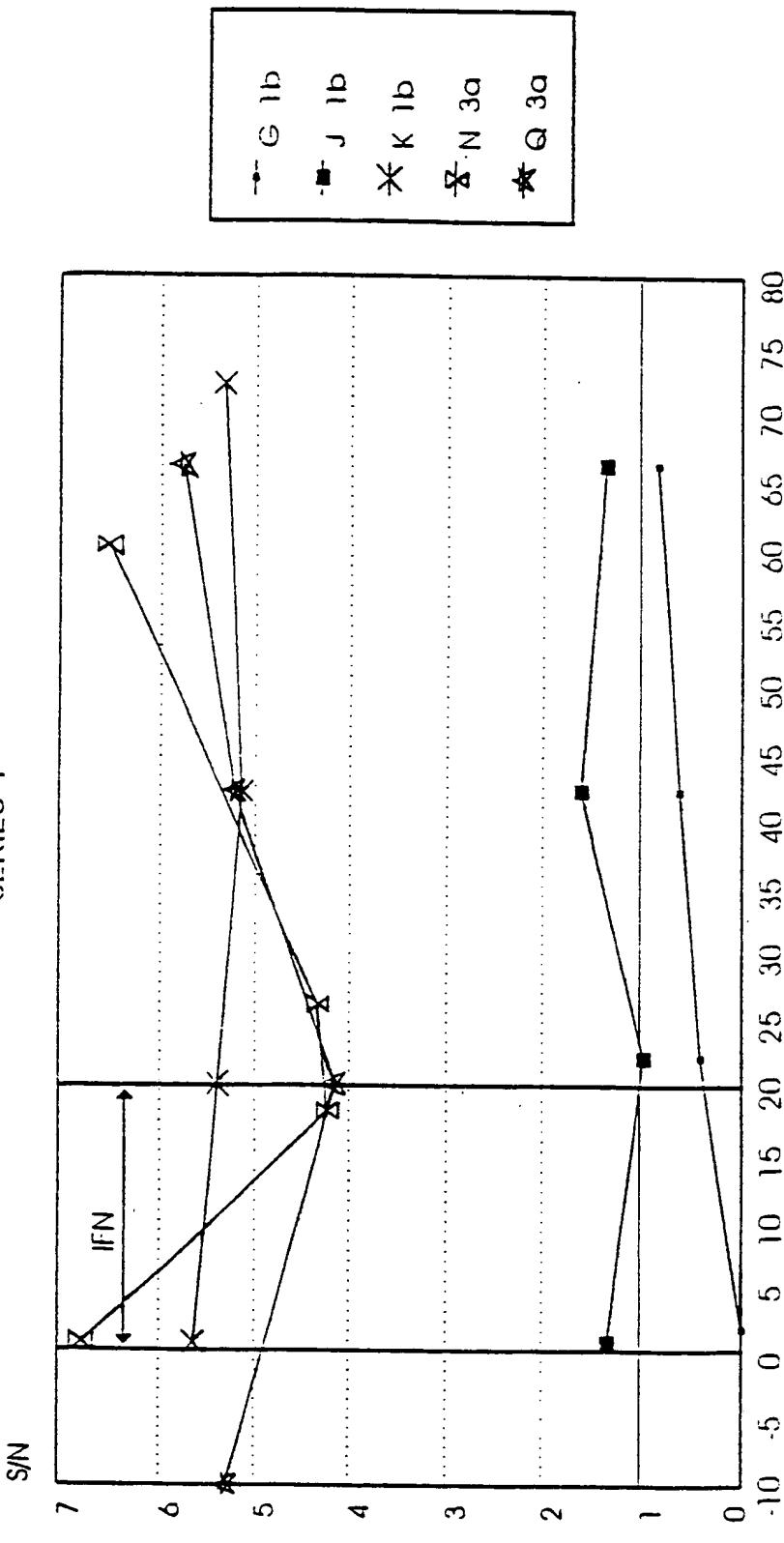


Fig.14

Anti-E1 (epitope 1) levels in NON-RESPONDERS to IFN treatment

SERIES 1



weeks after start of treatment

Fig. 15

Anti-E1 (epitope 1) levels in RESPONDERS to IFN treatment

SERIES 1

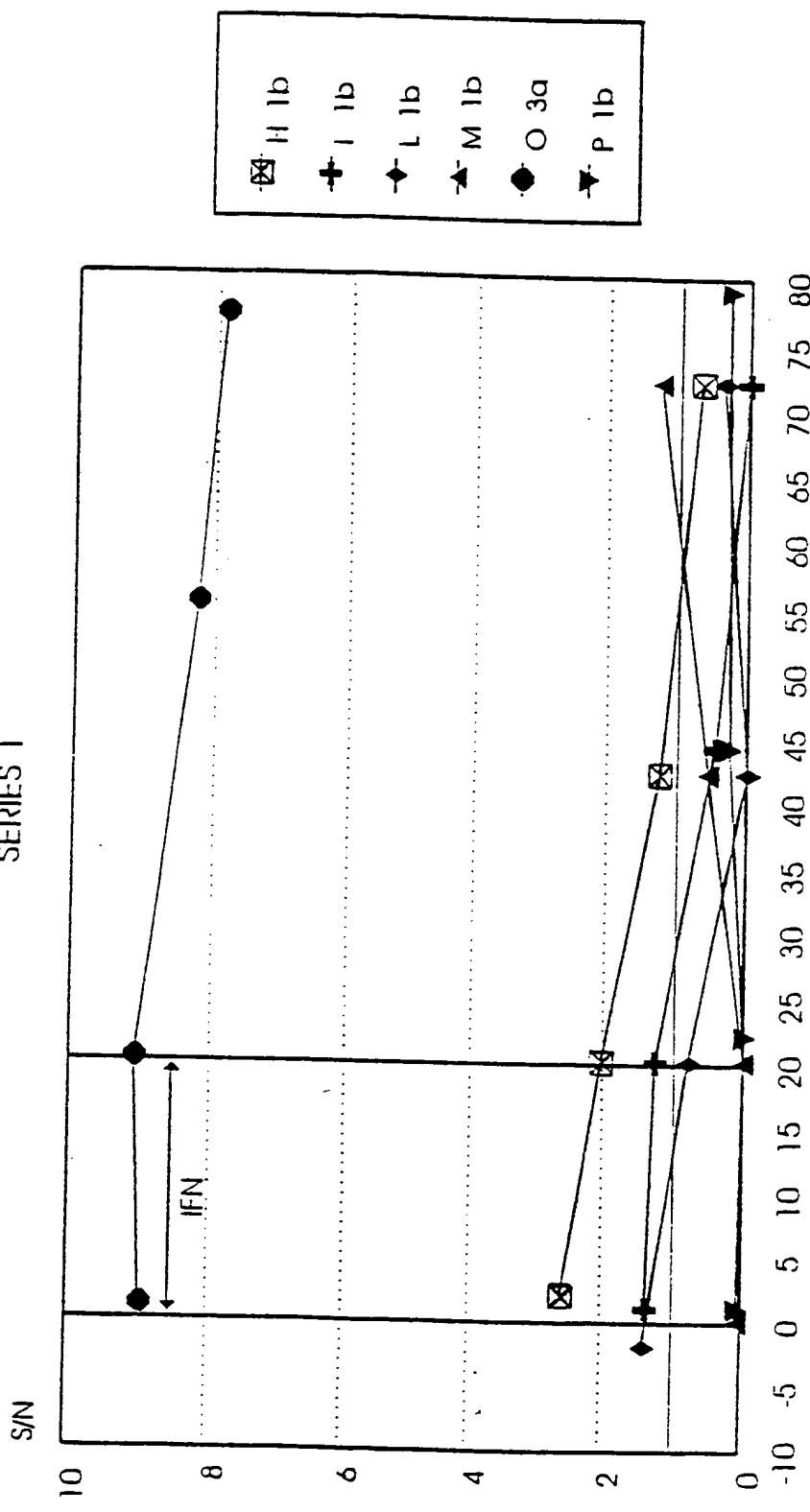
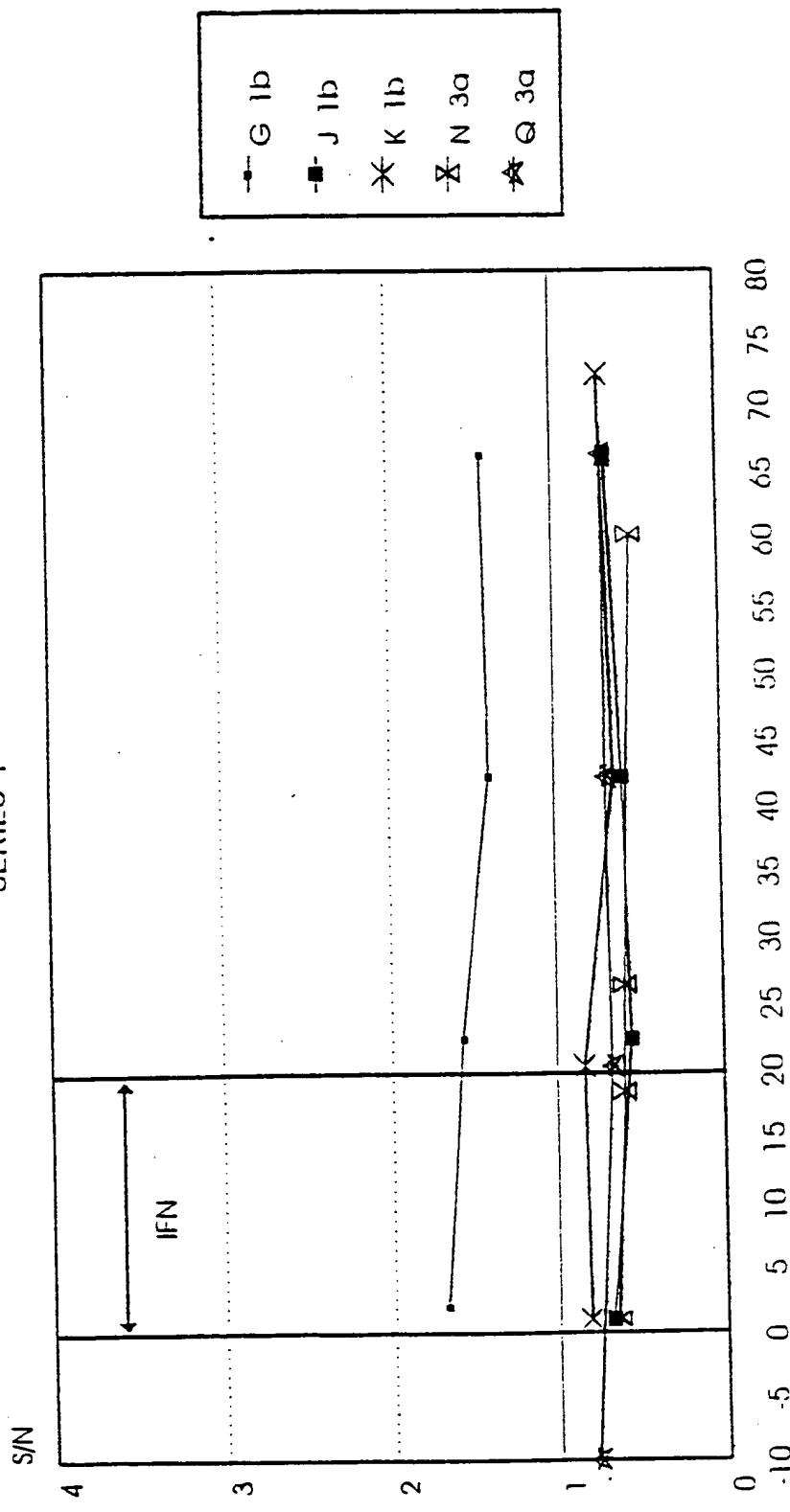


Fig. 16
weeks after start of treatment

Anti-E1 (epitope 2) levels in NON-RESPONDERS to IFN treatment

SERIES 1

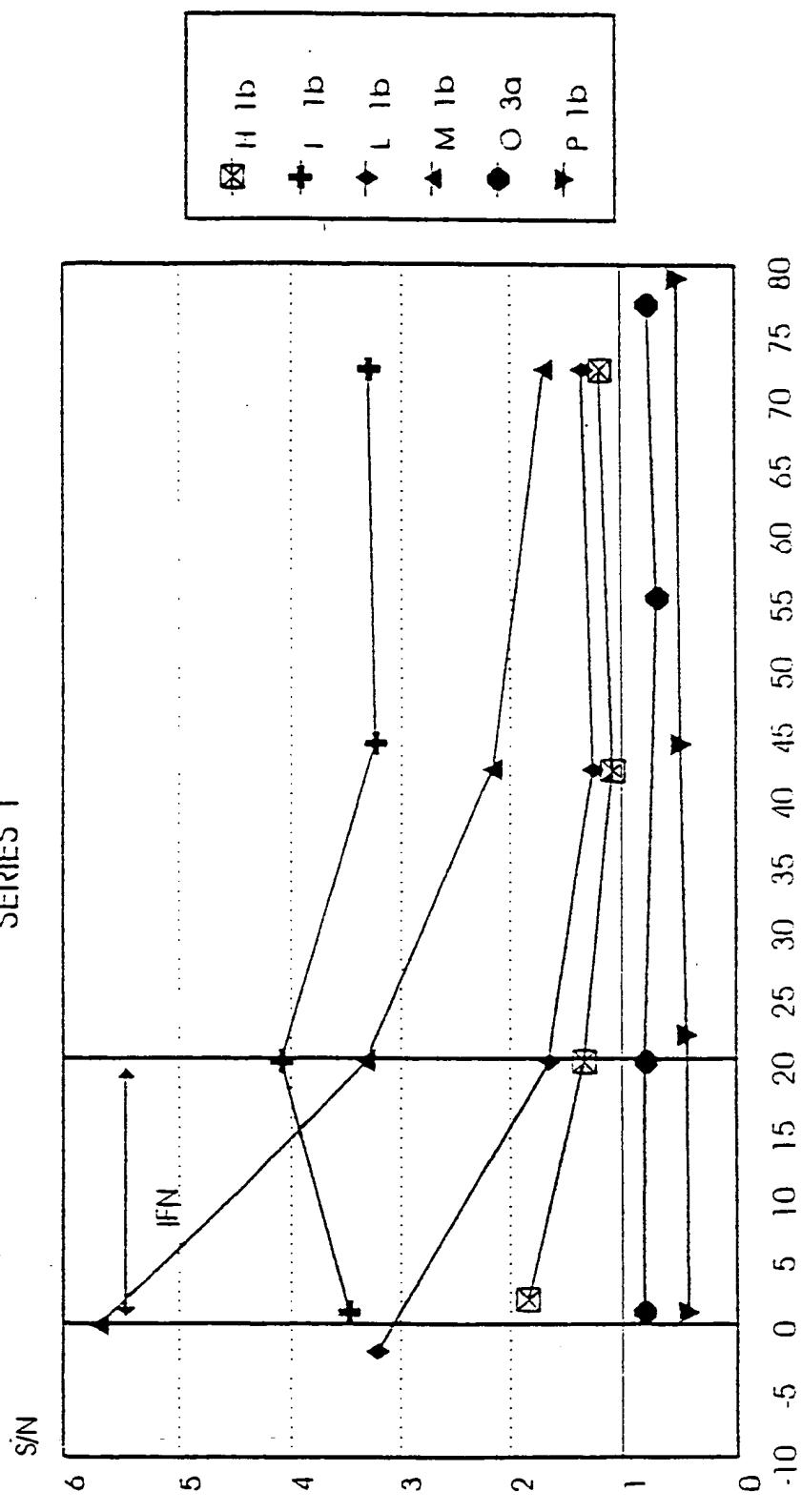


weeks after start of treatment

Fig.17

Anti-E1 (epitope 2) levels in RESPONDERS to IFN treatment

SERIES 1



weeks after start of treatment

Fig. 18

Competition of reactivity of anti-E2 Mabs with peptides

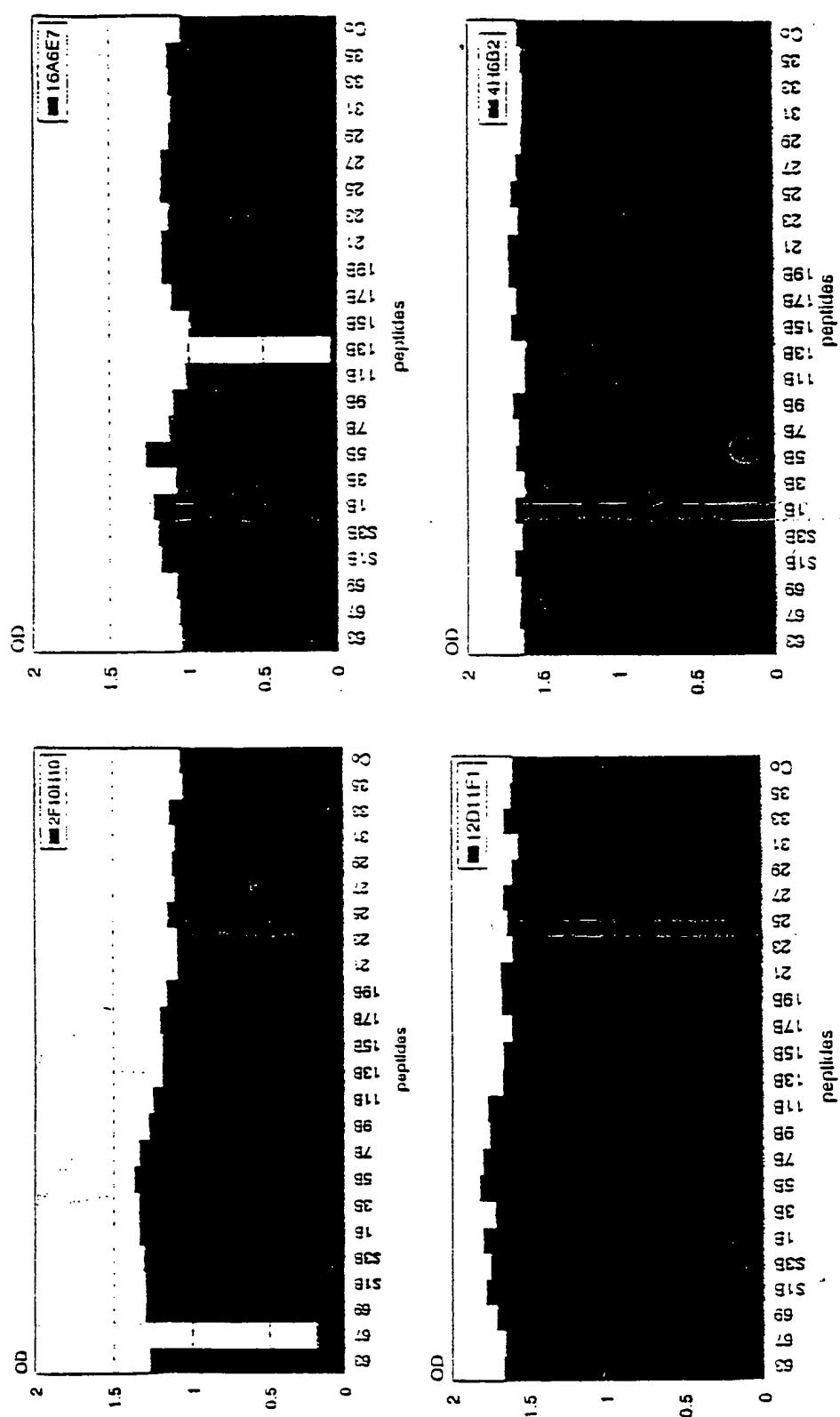


Fig.19

Human anti-E2 reactivity competed with peptides

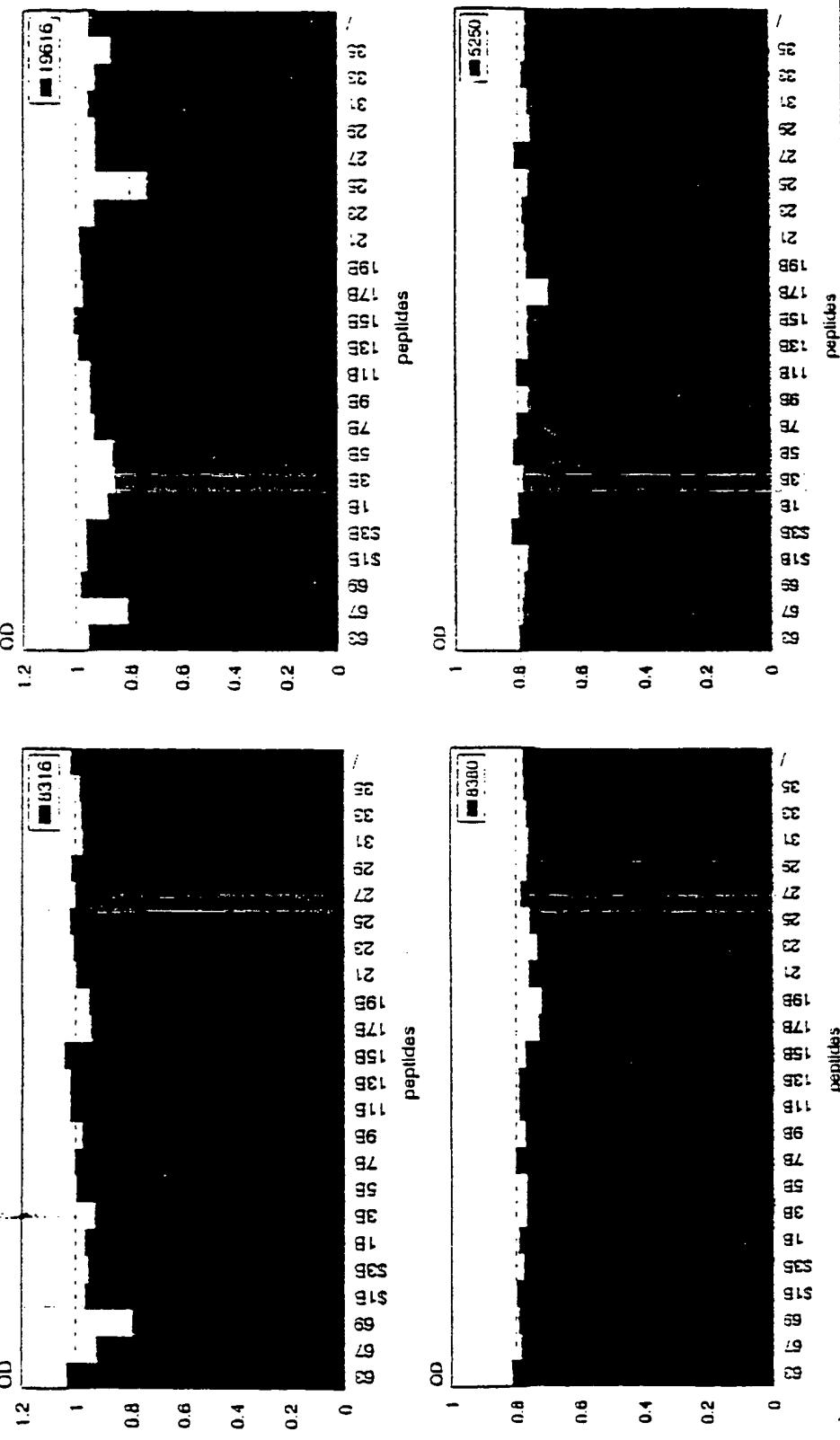


Fig. 20

Fig. 21A

5' GGCATGCAAGCTTAATTAATT3' (SEQ ID NO 1)
3'ACGTCCGTACGTTCGAATTAATTAATCGA5' (SEQ ID NO 94)

5'CCGGGGAGGGCTGCACGTGATCGAGGGCAGACACCATCACACCACATCACTAATAGT
TAATTAACTGCA 3' (SEQ ID NO 2)
3'CCTCCGGACGTGCACTAGCTCCGTCTGTGGTAGTGGTAGTGATTATCAATTAATTG
5' (SEQ ID NO 95)

SEQ ID NO 3 (HCC19A)

ATGCCCGGTTGCTCTTCTATCTTCCCTCTGGCTTTACTGTCCTGTCGACCAATTCCA
GCTTCCGCTTATGAGGTGCGCAACGTGTCGGGATGTACCATGTCACGAACGACTGCT
CCAACCTCAAGCATTGTATGAGGCAGCGGACATGATCATGCACACCCCCGGGTGCGT
GCCCTGCGTTGGGAGAACAAACTCTTCCCGCTGCTGGGTAGCGCTCACCCCCACGCTC
GCAGCTAGGAACGCCAGCGTCCCCACCACGACAATACGACGCCACGTCGATTTGCTCG
TTGGGGCGGCTGCTCTGTTCCGCTATGTACGTGGGGATCTCTGCGGATCTGTCTTC
CTCGTCTCCAGCTGTTACCATCTCGCCTGCCGGCATGAGACGGTGCAGGACTGCA
ATTGCTCAATCTATCCCGGCCACATAACAGGTACCGTATGGCTTGGATATGATGAT
GAACTGGTGCCTACAAACGGCCCTGGTGGTATCGCAGCTGCTCCGGATCCCACAAGCT
GTCGTGGACATGGTGGCGGGGGCCATTGGGGAGTCCTGGCGGGCTGCGCTACTATT
CCATGGTGGGGAACTGGGCTAAGGTTTGATTGTGATGCTACTCTTGCTCTTAATAG

SEQ ID NO 5 (HCC110A)

ATGTTGGGTAAGGTATCGATACCCCTACATGCGGCTTCGCCGACCTCGTGGGTACA
TTCCGCTCGTGGCGCCCCCTAGGGGGCGCTGCCAGGGCCCTGGCGCATGGCGTCCG
GGTTCTGGAGGAACGGCGTGAACATATGCAACAGGGAATTGCCCGTTGCTCTTCTCT
ATCTTCTCTGGCTTGCTGTCTGACCGTCCAGCTCCGCTTATGAAGTGC
CAACGTGTCCGGATGTACCATGTCACGAACGACTGCTCCAACCTCAAGCATTGTGTAT
GAGGCAGCGGACATGATCATGCACACCCCCGGGTGCGTGCCTGCGTTGGGAGAAC
AACTCTTCCCGCTGCTGGTAGCGCTACCCCCACGCTCGCAGCTAGGAACGCCAGCG
TCCCCACCAACGACAATACGACGCCACGTCGATTTGCTCGTTGGGGCGGCTGCTTCTG

Fig. 21B

TTCCGCTATGTACGTGGGGACCTCTGCGGATCTGCTTCCTCGTCTCCAGCTGTTCA
CCATCTCGCCTCGCCGGCATGAGACGGTGCAGGACTGCAATTGCTCAATCTATCCCGG
CCACATAACGGGTACCCGTATGGCTTGGGATATGATGATGAACTGGTGCCTACAACG
GCCCTGGTGGTATCGCAGCTGCTCCGGATCCCACAAGCTGTCGTGGACATGGTGGCGG
GGGCCATTGGGGAGTCTGGCGGGTCTCGCCTACTATTCCATGGTGGGGACTGGC
TAAGGTTTGATTGTGATGCTACTCTTGCTCCCTAATAG

SEQ ID NO 7 (HCCI11A)

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TTCCGCTCGTCGGCGCCCCCTAGGGGGTCTGCCAGAGCCCTGGCGCATGGCGTCCG
GGTTCTGGAAGACGGCGTGAACATATGCAACAGGGATTGCTGGTTGCTCTTCTCTA
TCTTCCTCTGGCTTACTGTCTGTGACCATTCCAGCTTCCGCTTATGAGGTGCGC
AACGTGTCCGGGATGTACCATGTCAACGACTGCTCCAACCTAACGATTGTGTATG
AGGCAGCGGACATGATCATGCAACACCCCCGGTGCCTGCCTGCCTCGGGAGAAC
ACTCTTCCCCTGCTGGTAGCGCTCACCCCCACGCTCGCAGCTAGGAACCCAGCG
CCCCACTACGACAATACGACGCCACGTGATTGCTCGTTGGGGCGGCTGCTTCTGTT
CCGCTATGTACGTGGGGATCTCTGCGGATCTGCTTCTCGTCTCCAGCTGTTCAAC
ATCTCGCCTCGCCGGCATGAGACGGTGCAGGACTGCAATTGCTCAATCTATCCCGG
ACAATAACAGGTACCCGTGGCTTGGGATATGATGAACTGGTAATAG

SEQ ID NO 9 (HCCI12A)

ATGCCCGGTTGCTCTTCTATCTTCCCTTGGCCCTGCTGTCTGTGACCATAACCA
GCTTCCGCTTATGAAGTGCACACGTGCTCCGGGTGTACCATGTCACGAACGACTGCT
CCAACCTAACGATAGTGTATGAGGCAGCGGACATGATCATGCAACACCCCCGGTGC
GCCCTGCCTCGGGAGGGCAACTCTCCGTTGCTGGGTGGCGCTACTCCCACGCTC
GCGGCCAGGAACGCCAGCGTCCCCACAACGACAATACGACGCCACGTCGATTGCTC
GTTGGGGCTGCTGCTTCTGCTGCTATGTACGTGGGGATCTCTGCGGATCTGTTT
CTTGTCTTCCAGCTGTTACCTCTCACCTCGCCGGCATCAAACAGTACAGGACTGCA
ACTGCTCAATCTATCCCGCCATGTATCAGGTACCGCATGGCTTGGGATATGATGAT
GAACTGGTCTTAATAG

SEQ ID NO 11 (HCCI13A)

ATGTCGGGTTGCTCTTCTATCTTCCCTTGGCCCTGCTGTCTGTGACCATAACCA
GCTTCCGCTTATGAAGTGCACACGTGCTCCGGGTGTACCATGTCACGAACGACTGCT
CCAACCTAACGATAGTGTATGAGGCAGCGGACATGATCATGCAACACCCCCGGTGC

Fig. 21C

GCCTGCCTCGGGAGGGCAACTCCCTCCCGTTGCTGGGTGGCGCTCACTCCCACGCTC
GCGGCCAGGAACGCCAGCGTCCCCACAACGACAATACGACGCCACGTCGATTGCTC
GTTGGGGCTGCTGCTTCTGTTCCGCTATGTACGTGGGGATCTCTGCGGATCTGTTT
CCTTGTTCAGCTGTTCACCTCTCACCTCGCCGGCATCAAACAGTACAGGACTGCA
ACTGCTCAATCTATCCCGGCCATGTATCAGGTACCGCATGGCTGGGATATGATGAT
GAACGGTAATAG

SEQ ID NO 13 (HCC17A)

ATGCTGGTAAGGCCATCGATAACCTTACGTGGGCTTCGCCGACCTCGTGGGTACA
TTCCGCTCGTCGGCGCCCCCTAGGGGGCGCTGCCAGGGCCCTGGCGCATGGCGTCCG
GGTTCTGGAAGACGCCGTGAACATATGCAACAGGGATTGCTGGTGTCTTCTCTA
TCTTCCTCTTGGCTTACTGTCTGTCTAACCAATTCCAGCTTCCGCTTACGAGGGTGC
AACGTGTCCCCGATGTACCATGTCACGAACGACTGCTCCAACCTAACGCATTGTGTATG
AGGCAGCGGACATGATCATGCACACCCCCGGTGCCTGCCCTGCGTTGGGAGAAC
ACTCTTCCCCTGCTGGTAGCGCTCACCCCCACGCTCGCGGCTAGGAACGCCAGCAT
CCCCACTACAACAATACGACGCCACGTCGATTGCTCGTTGGGCGGCTGTTCTGTT
CCGCTATGTACGTGGGGATCTCTGCGGATCTGTCTTCTCGTCTCCAGCTGTTCA
ATCTCGCCTCGCCGGCATGAGACGGTGCAGGACTGCAATTGCTCAATCTATCCCGCC
ACATAACGGTCACCGTATGGCTGGGATATGATGATGAACGGTACTAATAG

SEQ ID NO 15 (HCPr51)

ATGCCCGGTTGCTTTCTCTATCTT

SEQ ID NO 16 (HCPr52)

ATGTTGGTAAGGTATCGATAACCT

SEQ ID NO 17 (HCPr53)

CTATTAGGACCAGTTATCATCATCATATCCCA

SEQ ID NO 18 (HCPr54)

CTATTACCAAGTTATCATCATCATATCCCA

SEQ ID NO 19 (HCPr107)

ATACGACGCCACGTCGATTCCCAGCTGTTACCATC

Fig. 21D

SEQ ID NO 20 (HCP108)

GATGGTAAACAGCTGGAAATCGACGTGGCGTGTAT

SEQ ID NO 21 (HCC137)

ATGTTGGGTAAAGGTATCGATACCCCTACATGCGGCTTCGCCGACCTCGTGGGTACA
TTCCGCTCGTCGGCGCCCCCTAGGGGGCGCTGCCAGGGCCCTGGCGCATGGCGTCCG
GGTTCTGGAGGACGGCGTGAACATATGCAACAGGGAAATTGCCCGGTTGCTCTTCTCT
ATCTTCCCTCTGGCTTGCTGTCTGTGACCGTTCCAGCTTCCGCTTATGAAGTGC
CAACGTGTCCGGATGTACCATGTCACGAACGACTGCTCCAACCTCAAGCATTGTGTAT
GAGGCAGCGGACATGATCATGCACACCCCCGGTGCCTGCCCTGCCTGGGAGAAC
AACTCTTCCCGCTGCTGGTAGCGCTCACCCCCACGCTCGCAGCTAGGAACGCCAGCG
TCCCCACACGACAATACGACGCCACGTCGATTCCAGCTGTTACCATCTGCCCTCG
CCGGCATGAGACGGTGCAGGACTGCAATTGCTCAATCTATCCCGGCCACATAACGGGT
CACCGTATGGCTGGGATATGATGATGAACTGGTCCTACAAACGCCCTGGTGGTAT
CGCAGCTGCTCCGGATCCSACAAGCTGTCGTGGACATGGTGGCGGGGGCCATTGGGG
AGTCCTGGCGGGCTGGCTACTATTCCATGGTGGGAACTGGCTAAGGTTTGATTG
TGATGCTACTCTTGCTCCCTAATAG

SEQ ID NO 23 (HCC138)

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TTCCGCTCGTCGGCGCCCCCTAGGGGGCGCTGCCAGGGCCCTGGCGCATGGCGTCCG
GGTTCTGGAGGACGGCGTGAACATATGCAACAGGGAAATTGCCCGGTTGCTCTTCTCT
ATCTTCCCTCTGGCTTGCTGTCTGTGACCGTTCCAGCTTCCGCTTATGAAGTGC
CAACGTGTCCGGATGTACCATGTCACGAACGACTGCTCCAACCTCAAGCATTGTGTAT
GAGGCAGCGGACATGATCATGCACACCCCCGGTGCCTGCCCTGCCTGGGAGAAC
AACTCTTCCCGCTGCTGGTAGCGCTCACCCCCACGCTCGCAGCTAGGAACGCCAGCG
TCCCCACACGACAATACGACGCCACGTCGATTCCAGCTGTTACCATCTGCCCTCG
CCGGCATGAGACGGTGCAGGACTGCAATTGCTCAATCTATCCCGGCCACATAACGGGT
CACCGTATGGCTGGGATATGATGATGAACTGGTAA
TAG

SEQ ID NO 25 (HCC139)

ATGTTGGGTAAAGGTATCGATACCCCTACATGCGGCTTCGCCGACCTCGTGGGTACA
TTCCGCTCGTCGGCGCCCCCTAGGGGGCGCTGCCAGGGCCCTGGCGCATGGCGTCCG
GGTTCTGGAGGACGGCGTGAACATATGCAACAGGGAAATTGCCCGGTTGCTCTTCTCT

Fig. 21E

ATCTTCCTCTGGCTTGCTGTCCTGTCTGACCGTTCCAGCTTCCGCTTATGAAGTGCG
CAACGTGTCCGGATGTACCATGTACGAACGACTGCTCCAACCTCAAGCATTGTGTAT
GAGGCAGCGGACATGATCATGCACACCCCCGGGTGCGTGCCTGCGTTGGGAGAAC
AACTCTTCCCGCTGCTGGTAGCGCTCACCCCCACGCTCGCAGCTAGGAACGCCAGCG
TCCCCACCACGACAATACGACGCCACGTCGATTCCCAGCTGTTACCATCTCGCCTCG
CCGGCATGAGACGGTGCAGGACTGCAATTGCTCAATCTATCCGGCCACATAACGGGT
CACCGTATGGCTTGGATATGATGATGAACGGTGCCTACAACGGCCCTGGTGGTAT
CGCAGCTGCTCCGGATCGTCAACTAATAG

SEQ ID NO 27 (HCCI40)

ATGTTGGTAAGGTACGATAACCTTACATGCGGCTTCGCCGACCTCGTGGGTACA
TCCGCTCGTCGGCGCCCCCTAGGGGGCGCTGCCAGGGCCCTGGCGCATGGCGTCCG
GGTTCTGGAGGAACGGCGTGAACATATGCAACAGGGATTGCCCAGGGTTGCTCTCT
ATCTTCCTCTGGCTTCTGTCTGCTGACCGTTCCAGCTTCCGCTTATGAAGTGCG
CAACGTGTCCGGATGTACCATGTACGAACGACTGCTCCAACCTCAAGCATTGTGTAT
GAGGCAGCGGACATGATCATGCACACCCCCGGGTGCGTGCCTGCGTTGGGAGAAC
AACTCTTCCCGCTGCTGGTAGCGCTCACCCCCACGCTCGCAGCTAGGAACGCCAGCG
TCCCCACCACGACAATACGACGCCACGTCGATTCCCAGCTGTTACCATCTCGCCTCG
CCGGCATGAGACGGTGCAGGACTGCAATTGCTCAATCTATCCGGCCACATAACGGGT
CACCGTATGGCTTGGATATGATGATGAACGGTGCCTACAACGGCCCTGGTGGTAT
CGCAGCTGCTCCGGATCGTCAAGGGCAGACACCACCACTAATAG

SEQ ID NO 29 (HCCI62)

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CGCTCGTCGGCGCTCCCGTAGGAGGCGTCGCAAGAGGCCCTGCGCATGGCGTGGGGC
CCTTGAAGACGGATAAAATTGCAACAGGGATTGCCCAGGGTTGCTCTTTCTATT
TCCTCTCGCTCTGTTCTTGCCTAACCAACGACTGTTCCAATAGCAGTATTGTGACGG
ACGTCTGGCTCTATGTCTTACCAACGACTGTTCCAATAGCAGTATTGTGACGG
CGATGACGTTATTCTGCACACACCCGGCTGCATAACCTGTGTCAGGACGGCAATACA
TCCACGTGCTGGACCCAGTGACACCTACAGTGGCAGTCAAGTACGTGGAGCAACCA
CCGCTTCAACGCACTGTGGACCTATTAGTGGCGCGGCCACGATGTGCTCTGC
GCTCTACGTGGGTGACATGTGGGGCTGCTTCCCTGTCAGGACAAGCCTCACGTTCA
GACCTCGTCGCCATCAAACGGTCCAGACCTGTAACGTGCTCGCTGTACCCAGGGCAATCT
TTCAGGACATCGAATGGCTTGGATATGATGATGAACGGTAATAG

Fig. 21F

SEQ ID NO 31 (HCC163)

ATGGGTAAGGTATCGATACCTAACGTGCGGATTGCGCGATCTCATGGGTATATCC
CGCTCGTAGGGGGCCCCATTGGGGCGTCGCAAGGGCTCTGCACACGGTGTGAGGGT
CCTTGAGGACGGGTAAACTATGCAACAGGGAAATTACCCGGTTGCTCTTCTCTATCT
TTATTCTTGCTCTCTCGTGTCTGACCGTTCCGGCCTCTGCAGTCCCTACCGAAATG
CCTCTGGATTATCATGTTACCAATGATTGCCAAACTCTCCATAGTCTATGAGGCA
GATAACCTGATCCTACACGCACCTGGTTGCGTGCCTTGTGTATGACAGGTAATGTGA
GTAGATGCTGGTCCAAATTACCCCTACACTGTCAAGCCCCGAGCCTCGGAGCAGTCAC
GGCTCCTCTCGGAGAGCGTTGACTACCTAGCGGGAGGGGCTGCCCTTGCTCCGG
TTATACGTAGGAGACGCGTGTGGGCACTATTCTTGTTAGGCCAAATGTTACCTATA
GGCCTCGCCAGCACGCTACGGTGCAGAACTGCAACTGTTCCATTACAGTGGCCATGT
TACCGGCCACCGGATGGATATGATGATGAACTGGTAATAG

SEQ ID NO 33 (HCP109)

TGGGATATGATGATGAACTGGTC

SEQ ID NO 34 (HCP172)

CTATTATGGTGGTAAKGCCARCARCAGAGCAGGAG

SEQ ID NO 35 (HCC122A)

TGGGATATGATGATGAACTGGTCGCCTACAACGGCCCTGGTGGTATCGCAGCTGCTCC
GGATCCCACAAGCTGTCGTGGACATGGTGGCGGGGGCCATTGGGGAGTCCTGGCGG
GCCTCGCCTACTATTCCATGGTGGGAACTGGGCTAAGGTTTGGTTGTATGCTACTC
TTTGCCTGGCGTGCACGGGCAACCCCGGTGTCAGGAGGGCAGCAGCCTCCGATAACCA
GGGGCCTTGTGTCCCTTTAGCCCCGGTGGCTCAGAAAATCCAGCTCGTAAACAC
CAACGGCAGTTGGCACATCAACAGGACTGCCCTGAACTGCAACGACTCCCTCCAAAC
AGGGTTCTTGCCTGACTATTCTACAAACACAAATTCAACTCGTCTGGATGCCAGAG
CGCTTGGCCAGCTGTCGCTCCATCGACAAGTTGCTCAGGGTGGGTCCCCCTCACTT
ACACTGAGCCTAACAGCTGGACCAGAGGCCACTGCTGGCACTACGCGCCTCGACC
GTGTGGTATTGTACCCCGTCTCAGGTGTGCGGTCCAGTGTATTGCTTCACCCCGAGCC
CTGTTGTGGTGGGACGACCGATCGGTTGGTGTCCCCACGTATAACTGGGGCGAA
CGACTCGGATGTGCTGATTCTAACAAACACGCGGCCGCGAGGCAACTGGTTGGC
TGTACATGGATGAATGGCACTGGTTACCAAGACGTGTGGGGCCCCCGTGCACAA
TCGGGGGGCCGGCAACAAACACCTTGACCTGCCCACTGACTGTTTCGGAAGCACCC
CGAGGCCACCTACGCCAGATGCGGTTCTGGCCCTGGCTGACACCTAGGTGTATGGTT

Fig. 21G

CATTACCCATATAGGCTCTGGCACTACCCCTGCACTGTCAACTTCACCATCTTCAGGT
TAGGATGTACGTGGGGGGCGTGGAGCACAGGTTCGAAGCCGCATGCAATTGGACTCG
AGGAGAGCGTTGTGACTTGGAGGACAGGGATAGATCAGAGCTTAGCCCCGCTGCTGCTG
TCTACAAACAGAGTGGCAGATACTGCCCTGTTCTTCAACCACCCCTGCCGGCCCTATCCA
CCGGCCTGATCCACCTCCATCAGAACATCGTGGACGTGCAATACCTGTACGGTGTAGG
GTCGGCGGTTGTCTCCCTTGTATCAAATGGGAGTATGTCTGTTGCTCTTCCCTCTCCT
GGCAGACGCGCGCATCTGCGCCTGCTTATGGATGATGCTGCTGATAGCTAACGCTGAG
GCCGCCTTAGAGAACCTGGTGGTCCTCAATGCGGCGGCGTGGCCGGGCGCATGGC
ACTCTTCTTCTTGTGTTCTCTGTGCTGCCTGGTACATCAAGGGCAGGCTGGTCCC
TGGTGCGGCATACGCCCTCTATGGCGTGTGGCGCGTGTCTGCTCTGCTGGCCTTAC
CACCAACGAGCTTATGCCTAGTAA

SEQ ID NO 37 (HCCI41)

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CCTCGCCTACTATTCCATGGTGGGAACCTGGGCTAACGGTTGGTTGTGATGCTACTCT
TTGCCGGCGTGCACGGGCATACCCGCGTGTCAAGGAGGGGAGCAGCCTCCGATACCA
GGGGCCTTGTGTCCTCTTACGGGCGGCTCAGAAAATCCAGCTCGTAAACAC
CAACGGCAGTTGGCACATCAACAGGACTGCCCTGAACTGCAACGACTCCCTCCAAAC
AGGGTTCTTGCAGCTTACAAACACAAATTCAACTCGTCTGGATGCCAGAG
CGCTTGGCCAGCTGCGCTCCATCGACAAGTTGCTCAGGGGTGGGTCCCCCTCACTT
ACACTGAGCCTAACAGCTGGACCAGAGGCCCTACTGCTGGCACTACGCCCTCGACC
GTGTGGTATTGACCCCGTCTCAGGTGTGGTCCAGTGTATTGCTTCACCCCGAGCC
CTGTTGTGGTGGGACGACCGATCGGTTGGTCCCCACGTATAACTGGGGGGCGAA
CGACTCGGATGTGCTGATTCTCAACAAACACGCGGCCGCGAGGCAACTGGTTGGC
TGTACATGGATGAATGGCACTGGTTACCAAGACGTGTGGGGCCCCCGTGCAACA
TCGGGGGGCGGCAACAAACACCTTGACCTGCCCTACTGACTGTTTCGGAAGCACCC
CGAGGCCACCTACGCCAGATGCGGTTCTGGCCCTGGCTGACACCTAGGTGTATGGTT
CATTACCCATATAGGCTCTGGCACTACCCCTGCACTGTCAACTTCACCATCTTCAGGT
TAGGATGTACGTGGGGGGCGTGGAGCACAGGTTCGAAGCCGCATGCAATTGGACTCG
AGGAGAGCGTTGTGACTTGGAGGACAGGGATAGATCAGAGCTTAGCCCCGCTGCTGCTG
TCTACAAACAGAGTGGCAGAGTGGCAGAGCTTAATTAAATTAG

SEQ ID NO 39 (HCCI42)

GATCCCACAAGCTGCGTGGACATGGTGGCGGGGGCCATTGGGAGTCCTGGCGGG
CCTCGCCTACTATTCCATGGTGGGAACCTGGGCTAACGGTTGGTTGTGATGCTACTCT

Fig. 21H

TTGCCGGCGTCGACGGCATACCCGCGTCAGGAGGGCAGCAGGCCCGATACCA
GGGGCCTTGTGTCCCTCTTAGCCCCGGGCGGCTCAGAAAATCCAGCTCGTAAACAC
CAACGGCAGTTGGCACATCAACAGGACTGCCCTGAAGTCAACGACTCCCTCCAAAC
AGGGTTCTTGCCGCACTATTCTACAAACACAAATTCAACTCGTCTGGATGCCAGAG
CGCTTGGCCAGCTGCGCTCCATCGACAAGTTGCTCAGGGTGGGTCCCCACTT
ACACTGAGCCTAACAGCTGGACCAGAGGCCACTGCTGGCACTACGCCCTCGACC
GTGTGGTATTGTACCCGGTCTCAGGTGTGGCTCCAGTGTATTGCTTACCCCGAGCC
CTGTTGTGGTGGGACGACCGATCGGTTGGTGTCCCCACGTATAACTGGGGGGGAA
CGACTCGGATGTGCTGATTCTCAACAAACACGCCGCCGCCGAGGCCACTGGTTCGGC
TGTACATGGATGAATGGCACTGGGTTACCAAGACGTGTGGGGGCCCCCGTGCAACA
TCGGGGGGGCCGGCAACAAACACCTTGACCTGCCACTGACTGTTTCGGAAGCACCC
CGAGGCCACCTACGCCAGATGCGGTTCTGGCCCTGGCTGACACCTAGGTGTATGGTT
CATTACCCATATAGGCTCTGGCACTACCCCTGCACTGTCAACTTCAACATCTCAAGGT
TAGGATGTACGTGGGGGGCGTGGAGCACAGGTTGCAAGCCGATGCAATTGGACTCG
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TCTACAACAGGTGATCGAGGGCAGACACCATCACCACCATCACTAATAG

SEQ ID NO 41 (HCCI43)

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GGCATACCCGGCGTCAGGAGGGCAGGAGGCCCTCCGATACCAAGGGCCTTGTGTCCCT
CTTAGCCCCGGGCGGCTCAGAAAATCCAGCTCGTAAACACCAACGGCAGTTGGCAC
ATCAACAGGACTGCCCTGAAGTCAACGACTCCCTCCAAACAGGGTTCTTGCCGCAC
TATTCTACAAACACAAATTCAACTCGTCTGGATGCCAGAGCGCTGGCCAGCTGTG
CTCCATCGACAAGTTCGCTCAGGGTGGGTCCCCACTTACACTGAGCCTAACAGC
TCGGACCAGAGGCCACTGCTGGCACTACGCCCTCGACCGTGTGGTATTGTACCCG
CGTCTCAGGTGTGCGGCTCAGTGTATTGCTTACCCCGAGCCCTGGTGTGGTGGGAC
GACCGATCGGTTGGTGTCCCCACGTATAACTGGGGGGCGAACGACTCGGATGTGCTG
ATTCTCAACAAACACGCCGCCGCCGAGGCCAACCTGGTCCGCTGTACATGGATGAATG
GCACTGGGTTACCAAGACGTGTGGGGGCCCCCGTGCAACATGGGGGGCCGGCA
ACAAACACCTTGACCTGCCCACTGACTGTTTCGGAAGCACCCGAGGCCACCTACGC
CAGATGCGGTTCTGGCCCTGGCTGACACCTAGGTGTATGGTTATTACCCATATAGG
CTCTGGCACTACCCCTGCACTGTCAACTTACCCATCTCAAGGTTAGGATGTACGTGG
GGGCGTGGAGCACAGGTTGCAAGCCGATGCAATTGGACTCGAGGAGAGCGTTGTGA
CTTGGAGGACAGGGATAGATCAGAGCTTAGCCCGTGCTGCTGTACAACACAGAGTGG
CAGAGCTTAATTAATTAG

Fig. 21I

SEQ ID NO 43 (HCC144)

ATGGTGGGAACTGGCTAAGGTTGGTGTGATGCTACTCTTGCCTGGCGTCGACG
GGCATAACCGCGTGTCAAGGAGGGGCAGCAGCCTCCGATACCAGGGCCTTGTGCTCCCT
CTTAGCCCCGGTGGCTCAGAAAATCCAGCTCGTAAACACCAACGGCAGTTGGCAC
ATCAACAGGACTGCCCTGAAC TGCAACGACTCCCTCAAACAGGGTCTTGCCAC
TATTCTACAAACACAAATTCAACTCGTCTGGATGCCAGAGCGCTTGGCAGCTGTGCG
CTCCATCGACAAGTCGCTCAGGGTGGGTCCTCACTTACACTGAGCCTAACAGC
TCGGACCAGAGGCCACTGCTGGCACTACGCCCTCGACCGTGTGGTATTGTACCCG
CGTCTCAGGTGTGCGGTCCAGTGTATTGCTTCACCCCGAGCCCTGTGTGGTGGGAC
GACCGATCGGTTGGTGTCCCCACGTATAACTGGGGGCGAACGACTCGGATGTGCTG
ATTCTCAACAAACACGCCCGCGCGAGGCAACTGGTTCGGCTGTACATGGATGAATG
GCACTGGTTCAACCAAGACGTGTGGGGCCCCCGTGCACACATGGGGGGCGCGCA
ACAACACCTTGACCTGCCCACTGACTGTTTCGGAAGCACCCGAGGGCCACCTACCGC
CAGATCGGTTCTGGCCCTGGCTGACACCTAGGTGTATGGTTATTACCCATATAGG
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GGCGTGGAGCACAGGTCGAAGCCGATGCAATTGGACTCGAGGAGAGCGTTGTGA
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SEQ ID NO 45 (HCC164)

ATGGTGGCGGGGGCCATTGGGAGTCCTGGCGGGCCTCGCCTACTATTCCATGGTGG
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AGGACTGCCCTGAAC TGCAACGACTCCCTCAAACAGGGTCTTGCCTACTATTCT
ACAAACACAAATTCAACTCGTCTGGATGCCAGAGCGCTTGGCAGCTGTGCTCCAT
CGACAAGTCGCTCAGGGTGGGTCCTCACTTACACTGAGCCTAACAGCTCGGAC
CAGAGGCCACTGCTGGCACTACGCCCTCGACCGTGTGGTATTGTACCCCGTCTC
AGGTGTGCGGTCCAGTGTATTGCTTCACCCCGAGCCCTGTGTGGTGGGACGACCGA
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AACAAACACGCCGCCGCCGAGGCAACTGGTTCGGCTGTACATGGATGAATGGCACT
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ACCTTGACCTGCCCACTGACTGTTTCGGAAGCACCCGAGGCCACCTACGCCAGAT
GCGGTTCTGGCCCTGGCTGACACCTAGGTGTATGGTTATTACCCATATAGGCTCTGG
CACTACCCCTGCACTGCAACTTACCCATCTTCAAGGTTAGGATGTACGTGGGGGGCG

Fig. 21J

TGGAGCACAGGT CGAACGCCGATGCAATTGGACTCGAGGAGAGCGTTGTGACTTGGAGGACAGGGATAGATCAGAGCTTAGCCCGCTGCTGCTACAAACAGAGTGGCAGATACTGCCCTGTTCCCTCACCAACCCCTGCCGGCCCTATCCACCGGCCTGATCCACCTCCATCAAACATCGTGGACGTGCAAACCTGTACGGTGTAGGGTCGGCGGTTGTCTCCCTTGTCAATCAAATGGGAGTATGTCCTGTTGCTCTTCCCTCTCCTGGCAGACGCGCGCATCTGCGCCTGCTTATGGATGATGCTGCTGATAGCTCAAGCTGAGGCCGCCCTAGAGAACCTGGTGGCTCAATGCGGCCGCGCTGGCCGGGCGCATGGCACTCTTCCCTCCTTGTGTTCTTCTGTGCTGCCTGGTACATCAAGGGCAGGCTGGTCCTGGTGGCATACGCCCTCTATGGCGTGGCCGCTGCTCCTGCTGGCCTTACCAACACGAGCTTATGCCTAGTAA

SEQ ID NO 47 (HCC165)

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GGTTCTGGAGGACGGCGTGAACATGCAACAGGAAATTGCCGGTGTCTCTTCTCT
ATCTTCCTCTGGCTTGTCTGTCTGACCGTTCCAGCTTCCGCTTATGAAGTGCG
CAACGTGTCGGGATGTACCATGTCACGAACGACTGCTCCAACCTCAAGCATTGTGTAT
GAGGCAGCGGACATGATCATGCACACCCCCGGTGCCTGCCCTGCCTCGGGAGAAC
AACTCTTCCCGCTGCTGGTAGCGCTCACCCCCACGCTCGCAGCTAGGAACGCCAGCG
TCCCCACACGACAATACGACGCCACGTCGATTTGCTCGTGGGGCGGCTGCTTCTG
TTCCGCTATGTACGTGGGGACCTCTGCGGATCTGTCTTCTCGTCTCCAGCTGTTCA
CCATCTCGCCTGCCGGCATGAGACGGTGCAGGACTGCAATTGCTCAATCTATCCCG
CCACATAACGGTCACCGTATGGCTTGGGATATGATGATGAACTGGTCGCCTACAACG
GCCCTGGTGGTATCGCAGCTGCTCCGGATCCCACAAAGCTGTCGTGGACATGGTGGCGG
GGGCCCCATTGGGGAGTCTGGCGGGCTCGCTACTATTCCATGGTGGGAACGGGC
TAAGGTTTGGTTGTATGCTACTCTTGCCTGGCGTGCACGGCATACCCCGTGTCA
GAGGGGCAGCAGCCTCCGATACCAAGGGGCTTGTGCCTCTTACGGCCGGTGGCG
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GAAC TGCAACGACTCCCTCCAAACAGGGTTCTTGCCGCACTATTCTACAAACACAAA
TTCAACTCGTCTGGATGCCAGAGCGCTTGGCCAGCTGTCGCTCCATCGACAAAGTTCG
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CTGCTGGCACTACGGCGCTCGACCGTGTGGTATTGTACCCCGTCTCAGGTGTGGGT
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CCCCACGTATAACTGGGGGGCGAACGACTCGGATGTGCTGATTCTCAACAAACACGCC
CGGCCGCGAGGCAACTGGTTGGCTGTACATGGATGAATGGCACTGGGTTACCAAGA
CGTGTGGGGGCCCGTGCACATCGGGGGGGCGCAACAAACACCTTGACCTGCC

Fig. 21K

CCACTGACTGTTTCGGAAGCACCCCGAGGCCACCTACGCCAGATGCCGTTCTGGGCC
CTGGCTGACACCTAGGTGTATGGTCATTACCCATATAGGCTCTGGCACTACCCCTGCA
CTGTCAACTTCACCACTTCAAGGTTAGGATGTACGTGGGGGGCGTGGAGCACAGGTT
CGAAGCCGCATGCAATTGGACTCGAGGAGAGCGTTGTACTTGAGGGACAGGGATAG
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GGCGGCCGTGGCCGGGGCGCATGGCACTCTTCCTTGTTCTGTGCTGCC
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SEQ ID NC 49 (HCCI66)

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CTCGTGGGAGGCAGAACCTATCCCCAAGGCTGCCGACCCGAGGGTAGGGCCTGGG
CTCAGCCCGGGTACCCCTGGCCCTCTATGGCAATGAGGGCATGGGGTGGGCAGGATG
GCTCCTGTCACCCCGGGCTCTGGCCTAGTTGGGGCCCTACAGACCCCCGGCGTAGG
TCGGTAATTGGTAAGGTATCGATACCCCTACATGCCGTTGCCGACCTCGTGG
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CGTCCGGGTTCTGGAGGACGGCGTAACATGCAACAGGGAAATTGCCCGGTTGCTCT
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GTGCGCAACGTGTCCGGATGTACCATGTCACGAACGACTGCTCCAACCTAACGATTG
TGTATGAGGCAGCGGACATGATCATGCAACACCCCCGGGTGCGTGCCTGCGTTGGGA
GAACAACTCTCCGCTGCTGGTAGCGCTACCCCCACGCTCGCAGCTAGGAACGCC
AGCGTCCCCACCAACGACAATACGACGCCACGTCGATTGCTCGTTGGGGCGGCTGCTT
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AACGGCCCTGGTGGTATCGCAGCTGCTCCGGATCCCACAAAGCTGTCGTGGACATGGTG
GCGGGGGCCATTGGGGAGTCCTGGCGGGCCTGCCCTACTATTCCATGGTGGGGAACT
GGGCTAAGGTTTGGTTGTGATGCTACTCTTGCCGGCGTCGACGGGCATACCCCGCT
GTCAGGAGGGGCAGCAGCCTCCGATACCAAGGGCCTTGTGTCCTCTTAGCCCCGGG

Fig. 21L

TCGGCTCAGAAAATCCAGCTCGTAAACACCAACGGCAGTTGGCACATCAACAGGACT
GCCCTGAAC TGCAACGACTCCCTCCAAACAGGGTTCTTGCCGCACATTCTACAAAC
ACAAATTCAACTCGTCTGGATGCCAGAGCGCTTGGCAGCTGTCGCTCCATCGACAA
GTTCGCTCAGGGGTGGGTCCCCCTCACTTACACTGAGCCTAACAGCTCGGACCAGAGG
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TGGTGTCCACGTATAACTGGGGGGCGAACGACTCGGATGTGCTGATTCTCAACAAAC
ACGGCGCCGCCGCGAGGCAACTGGTCGGCTGTACATGGATGAATGGCACTGGTTCA
CCAAGACGTGTGGGGGCCCCCGTGCACACATCGGGGGGCCGGCAACAAACACCTTGA
CCTGCCCACTGACTGTTTCGGAAGCACCCGAGGCCACCTACGCCAGATCGGTT
TGGGCCCTGGCTGACACCTAGGTGTATGGTCATTACCCATATAGGCTCTGGCACTAC
CCCTGCCACTGTCAACTTCAACCATCTTCAAGGTTAGGATGTACGTGGGGGGCGTGGAGC
ACAGGTTCGAAGCCGATGCAATTGGACTCGAGGAGAGCGTTGTGACTTGGAGGACA
GGGATAGATCAGAGCTTAGCCGCTGCTGTCTACAACACAGAGTGGCAGATACTGCC
CTGTTCTTCAACCACCTGCCGCCCTATCCACCGGCCATCCACCTCCATCAGAAC
ATCGTGGACGTCAATACCTGTACGGTGTAGGGTGGCGGGTTGTCTCCCTTGTCTCA
AATGGGAGTATGTCTGTTGCTCTTCTTCTGGCAGACGGCGCATCTGCCCTGC
TTATGGATGATGCTGCTGATAGCTCAAGCTGAGGCCGCTTAGAGAACCTGGTGGTCC
TCAATGCCGCCGCGATGGCACTCTTCTTCTTGTGTTCTTGT
GCTGCCCTGGTACATCAAGGGCAGGCTGGTCCCTGGTGCAGGCAACGCCCTATGGCG
TGTGGCCGCTGCTCTGCTTGTGGCCTTACCAACCACGAGCTTATGGCTAGTAA

Fig. 22

OD measured at 450 nm
construct

Fraction	volume	dilution	39 Type 1b	40 Type 1b	62 Type 5a	63 Type 5a
-	START	23 ml 1/20	2.517	1.954	1.426	1.141
	FLOW THROUGH	23 ml 1/20	0.087	0.085	0.176	0.120
1	0.4 ml	1/200	0.102	0.051	0.048	0.050
2			0.396	0.550	0.090	0.067
3			2.627	2.603	2.481	2.372
4			3	2.967	3	2.694
5			3	2.810	2.640	2.154
6			2.694	2.499	1.359	1.561
7			2.408	2.481	0.347	1.390
8			2.176	1.970	1.624	0.363
9			1.461	1.422	0.887	0.504
10			1.286	0.926	0.543	0.519
11			0.981	0.781	0.294	0.294
12			0.812	0.650	0.249	0.199
13			0.373	0.432	0.239	0.209
14			0.653	0.371	0.145	0.184
15			0.441	0.348	0.151	0.151
16			0.321	0.374	0.098	0.106
17			0.525	0.186	0.099	0.108
18			0.351	0.171	0.083	0.090
19			0.192	0.164	0.084	0.087

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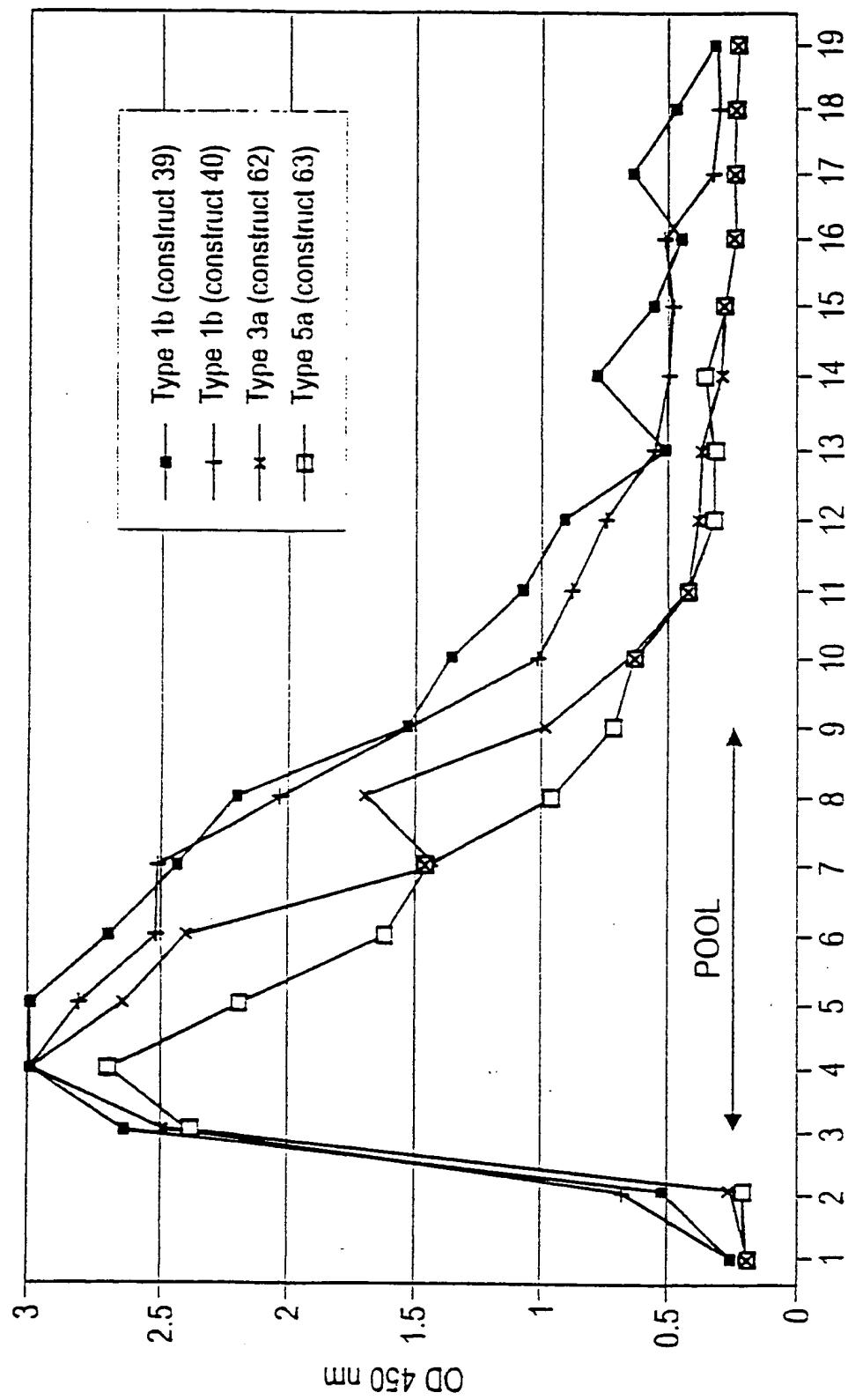


Fig. 23

Figure 24

Fraction	volume	dilution	OD measured at 450 nm			
			construct			
			39 Type 1b	40 Type 1b	62 Type 3a	63 Type 5a
20	250 μ l	1/200	0.072	0.130	0.096	0.051
21			0.109	0.293	0.084	0.052
22			0.279	0.249	0.172	0.052
23			0.093	0.151	0.297	0.054
24			0.080	0.266	0.438	0.056
25			0.251	0.100	0.457	0.048
26			3	1.649	0.722	0.066
27			3	3	2.526	0.389
28			3	3	3	2.345
29			3	3	2.349	2.580
30			2.227	1.921	1.424	1.333
31			0.263	0.415	0.356	0.162
32			0.071	0.172	0.154	0.064
33			0.103	0.054	0.096	0.057
34			0.045	0.045	0.044	0.051
35			0.043	0.047	0.045	0.046
36			0.045	0.045	0.049	0.040
37			0.045	0.047	0.046	0.048
38			0.046	0.048	0.047	0.057
39			0.045	0.048	0.050	0.057
40			0.046	0.049	0.048	0.049

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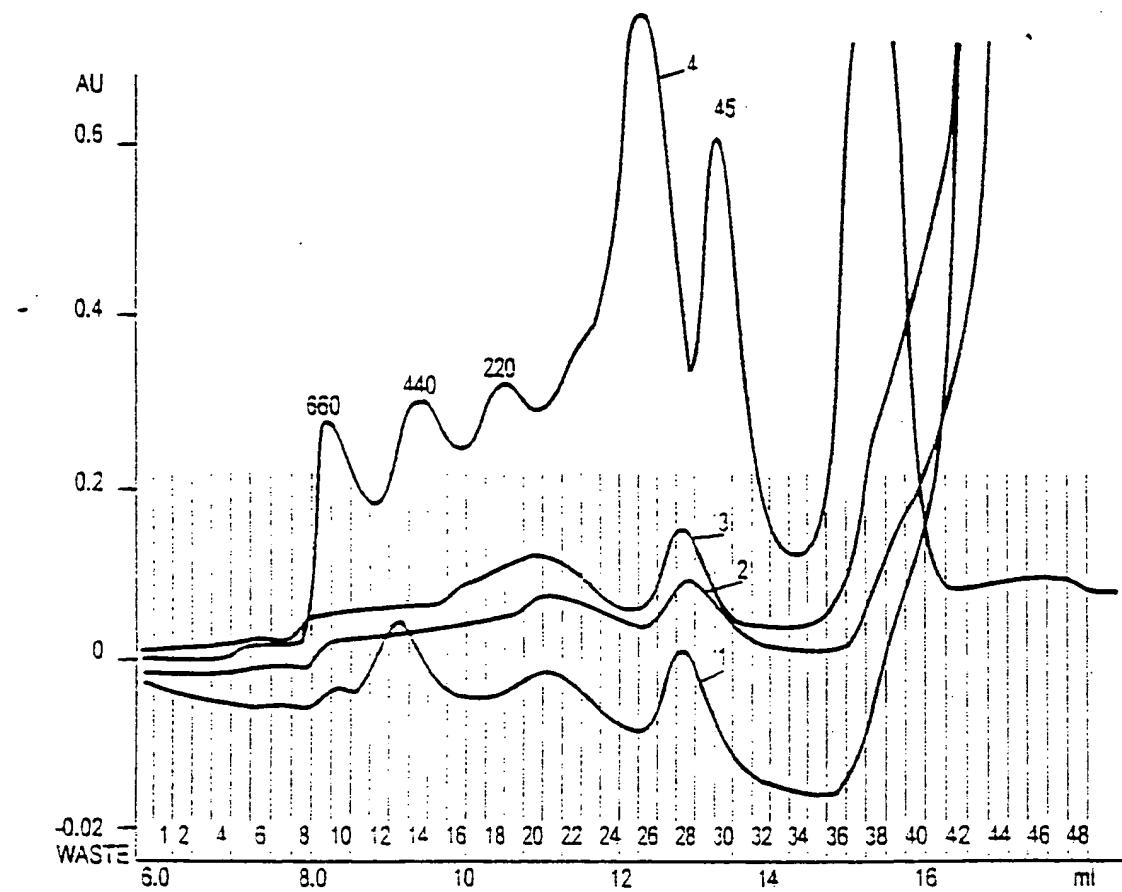


Fig. 25

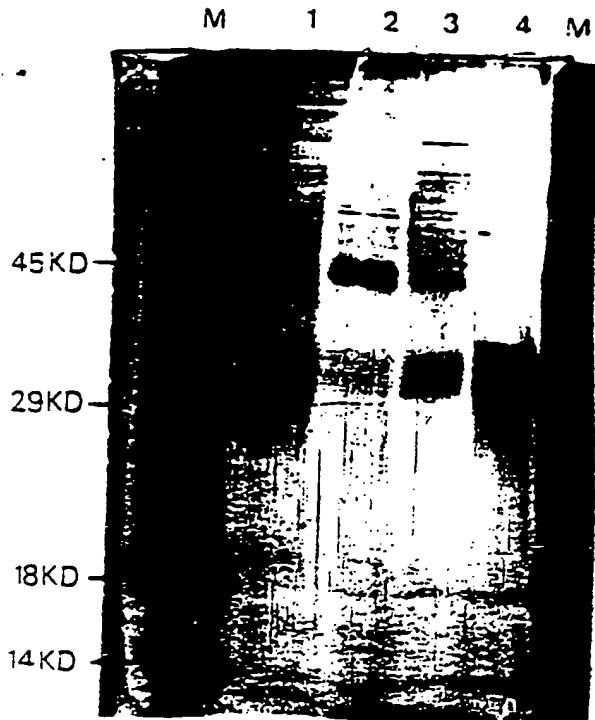


Fig. 26

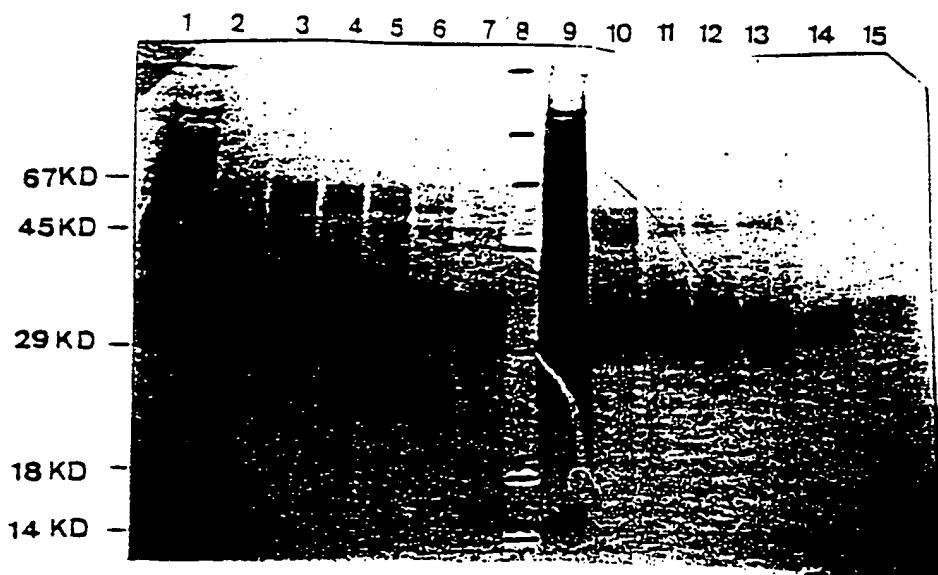


Fig. 27

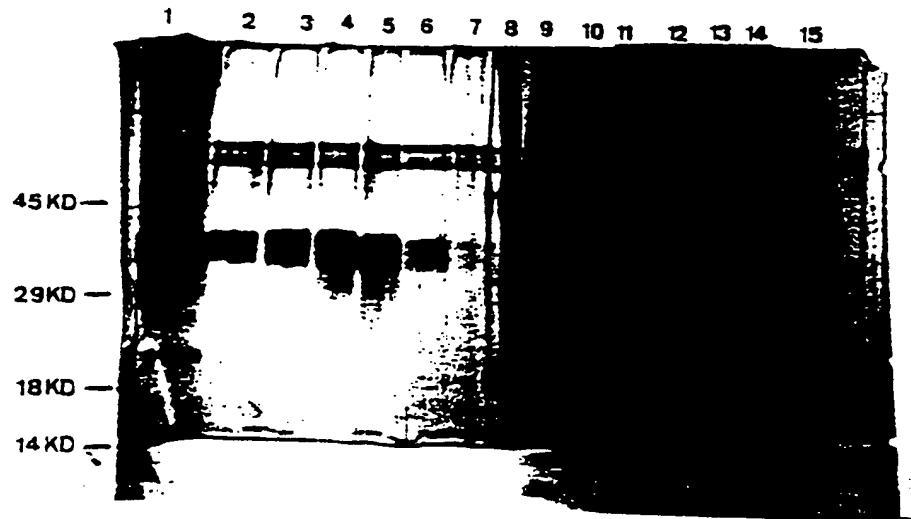
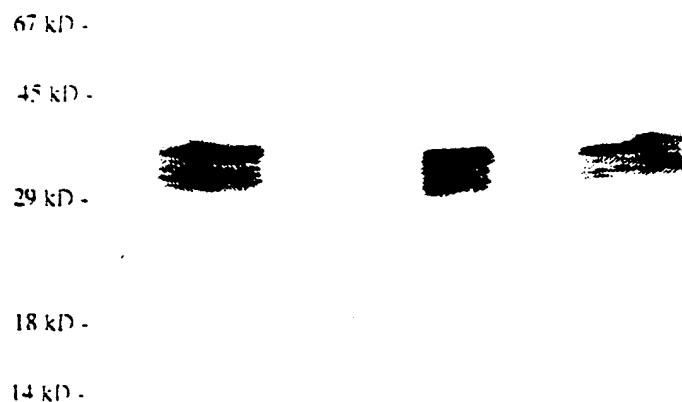


Fig.28

M 1 2 3 4 5 6

Fig.29



- Lane 1: Crude Lysate
- Lane 2: Flow through Lentil Chromatography
- Lane 3: Wash with EMPIGEN Lentil Chromatography
- Lane 4: Eluate Lentil Chromatography
- Lane 5: Flow through during concentration lentil eluate
- Lane 6: Pool of Elastin Size Exclusion Chromatography

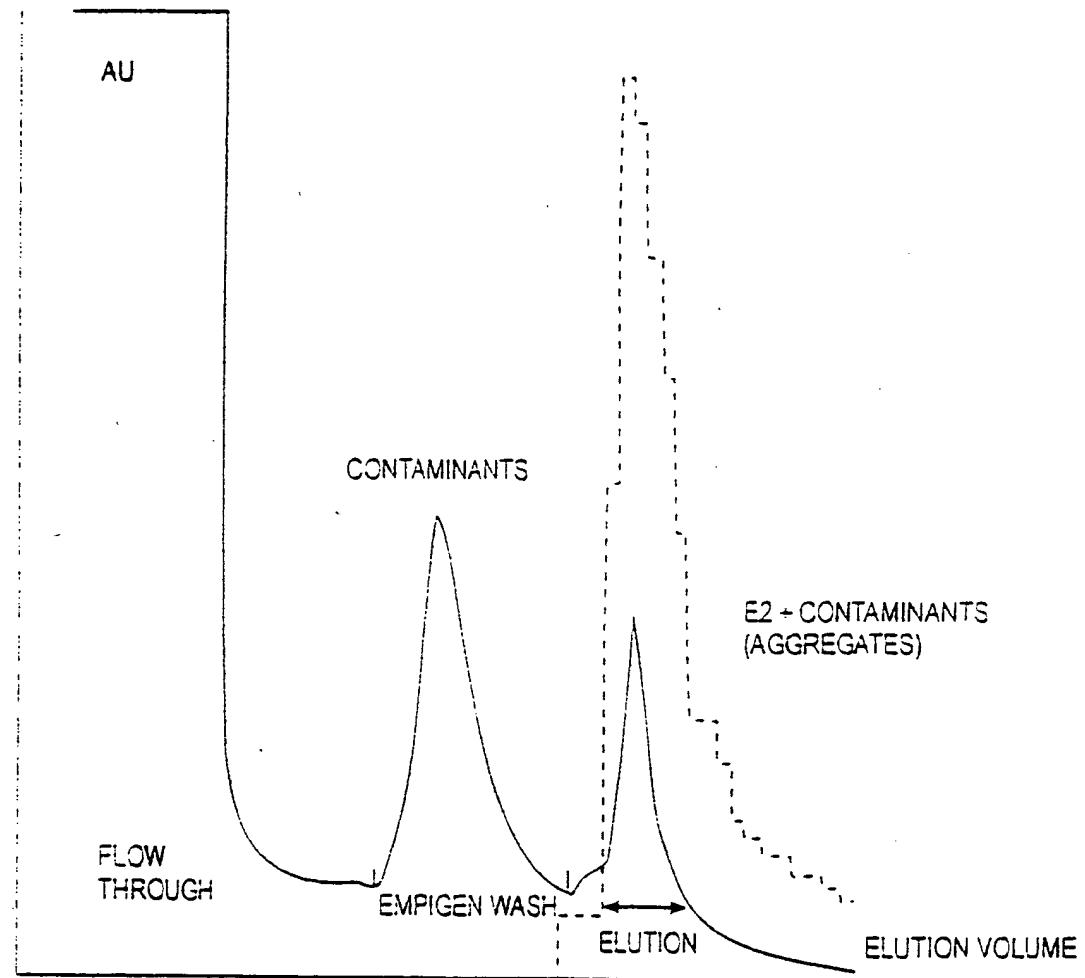
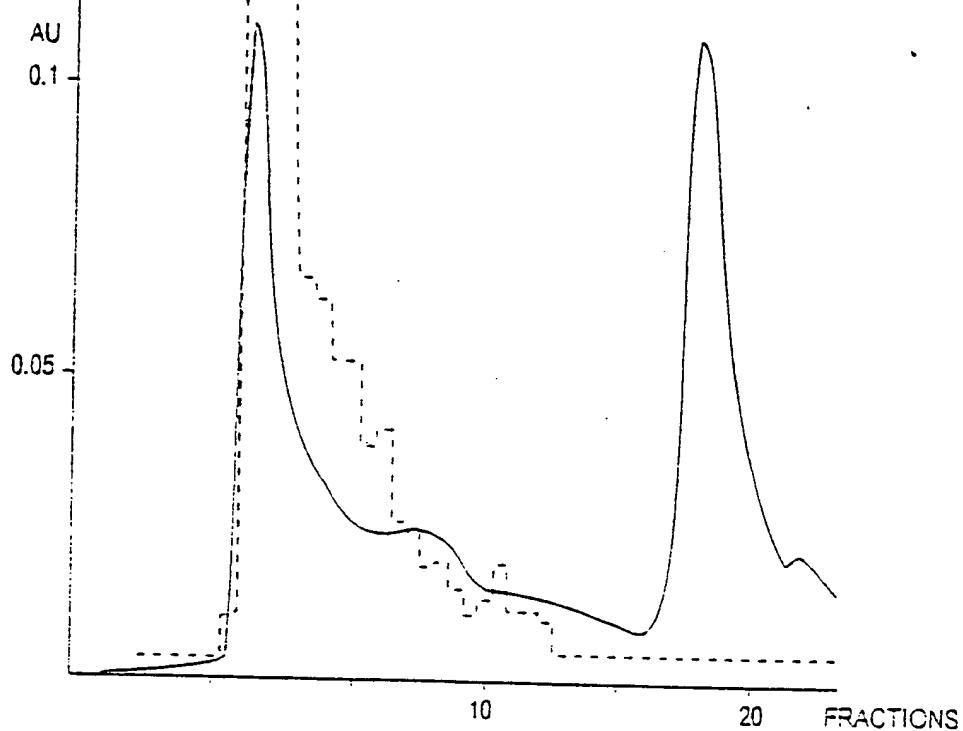


Fig. 30

NON - REDUCED

Fig. 31A

E2 + CONTAMINANTS (AGGREGATES)



REDUCED

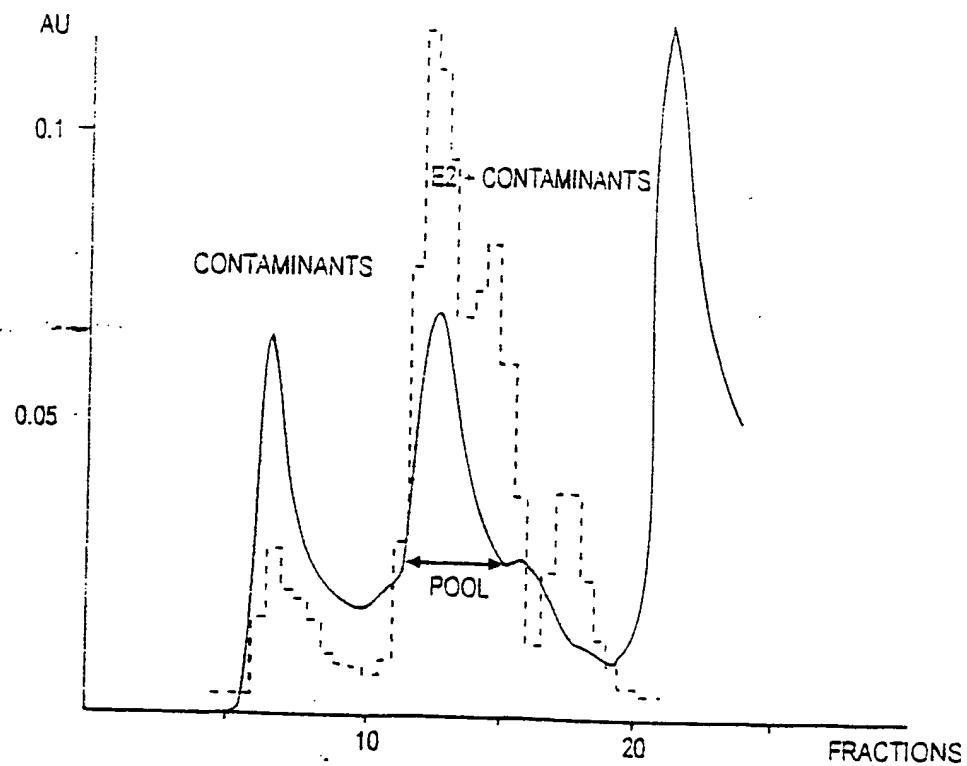


Fig. 31B

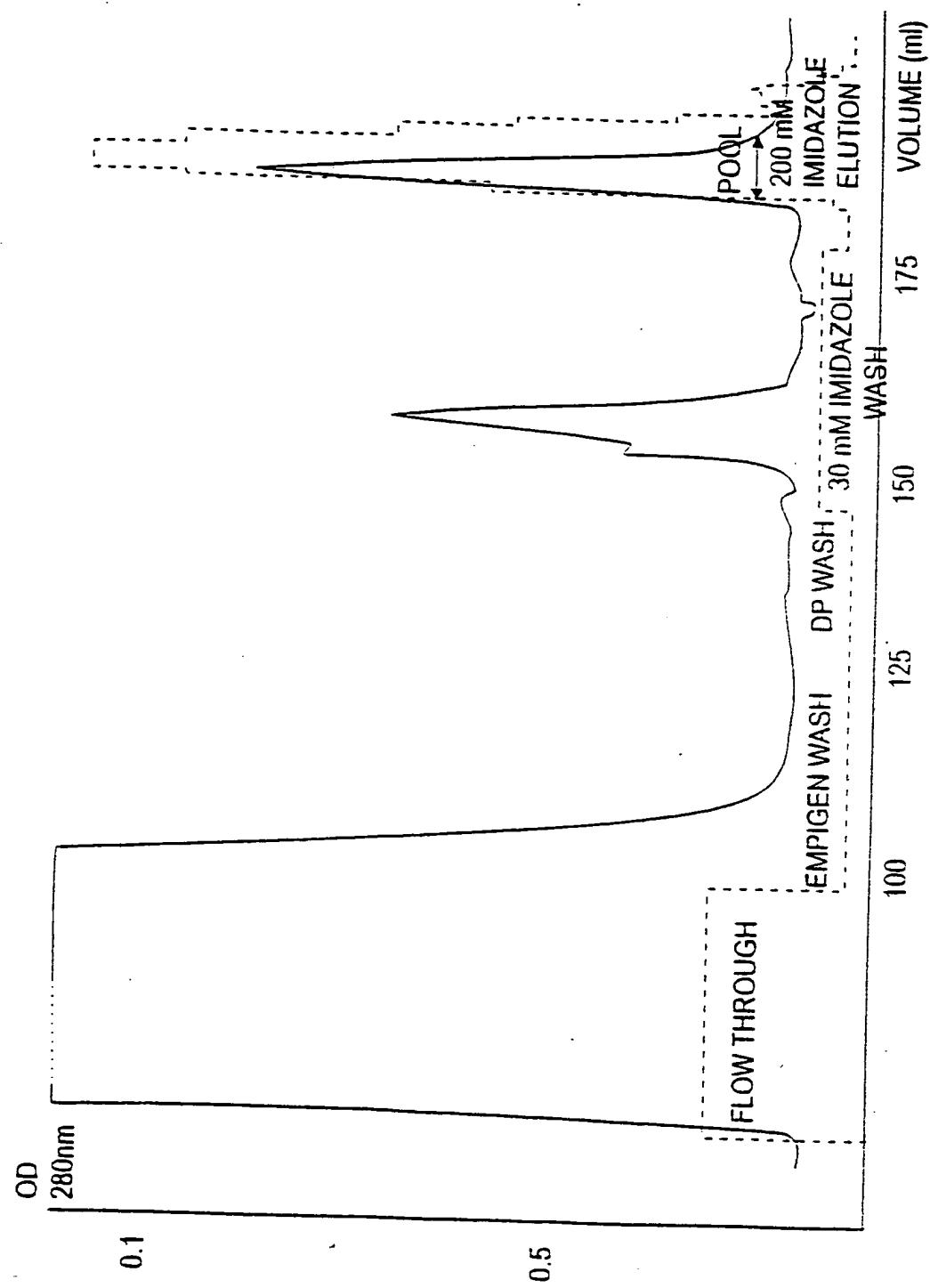
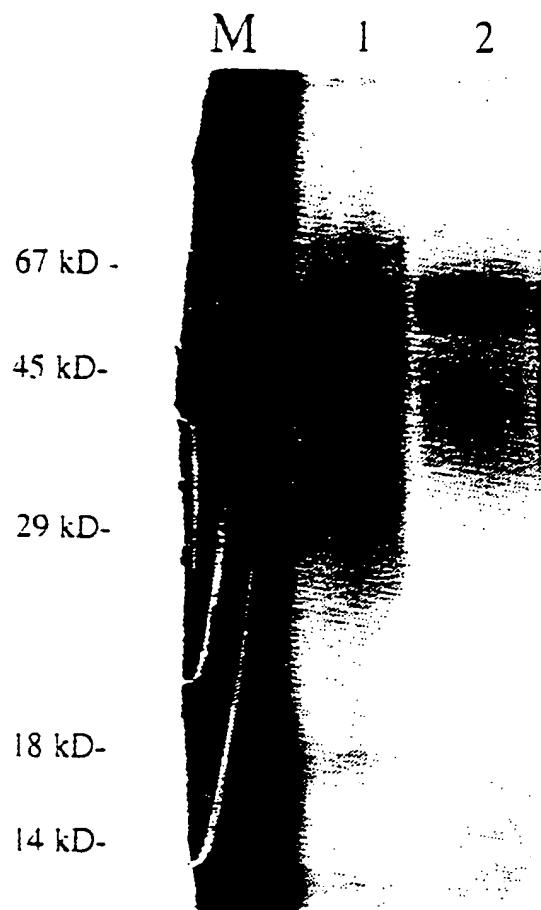


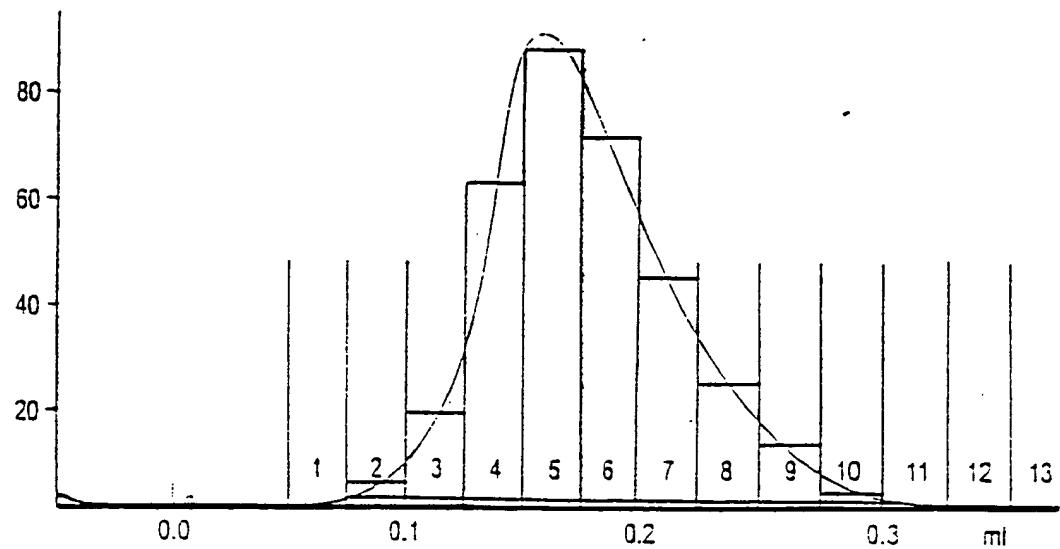
Fig. 32

SILVER STAIN OF PURIFIED E2



1. 30 mM IMIDAZOLE WASH Ni-IMAC
2. 0.5 μ g E2

Fig. 33



No.	Ret. (ml)	Peak start (ml)	Peak end (ml)	Dur (ml)	Area (ml ² *mAU)	Height (mAU)
1	0.045	0.046	0.043	0.04	0.0976	4.579
2	0.155	0.155	0.26	0.251	796.4167	889.377
3	0.227	0.226	0.31	0.083	0.0067	0.224
4	0.335	0.332	0.335	0.02	0.0002	0.018

Total number of detected peaks = 4
 Total Area above baseline = 0.796522 ml²*AU
 Total area in evaluated peaks = 0.796521 ml²*AU
 Ratio peak area / total area = 0.999999
 Total peak duration = 2.613583 ml

Fig. 34

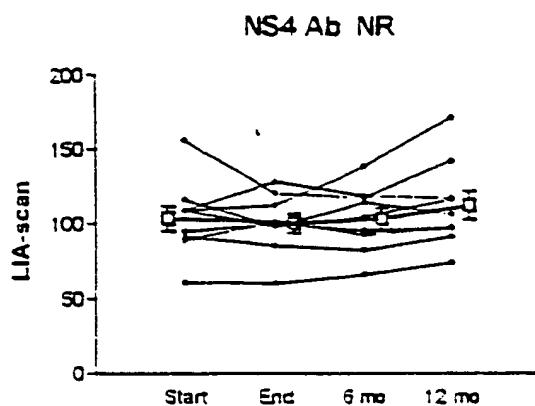


Fig. 35A-1

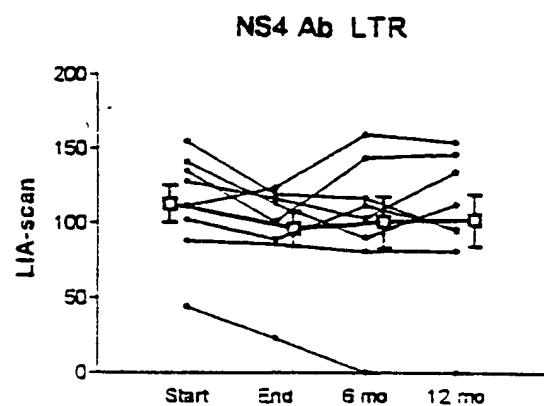


Fig. 35A-2

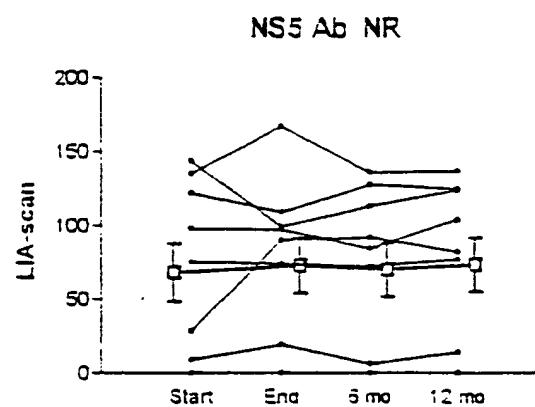


Fig. 35A-3

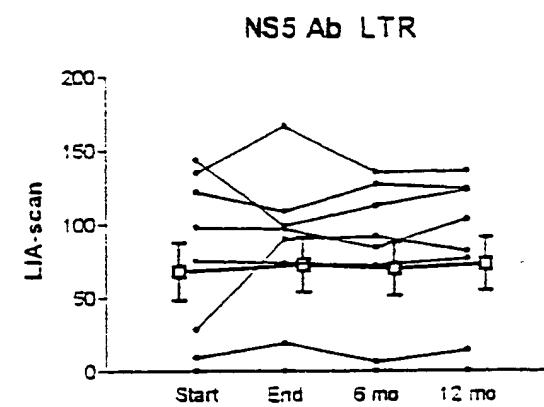


Fig. 35A-4

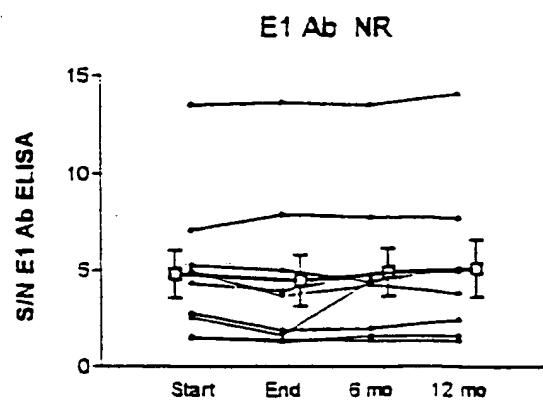


Fig. 35A-5

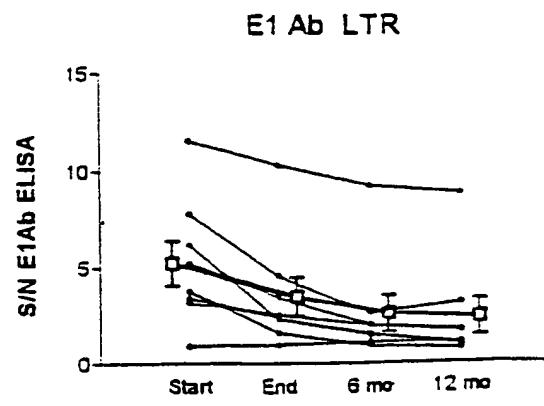


Fig. 35A-6

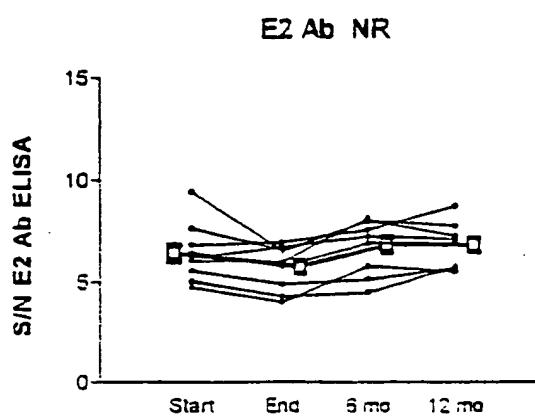


Fig. 35A-7

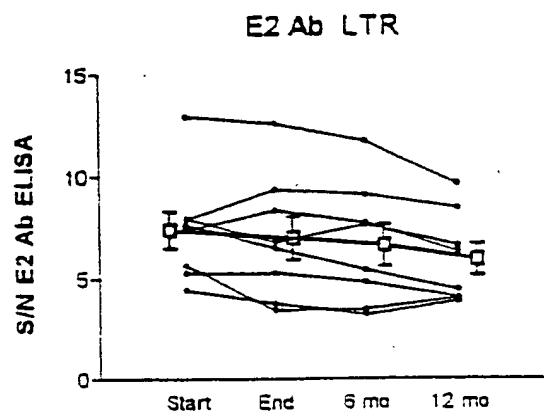


Fig. 35A-8

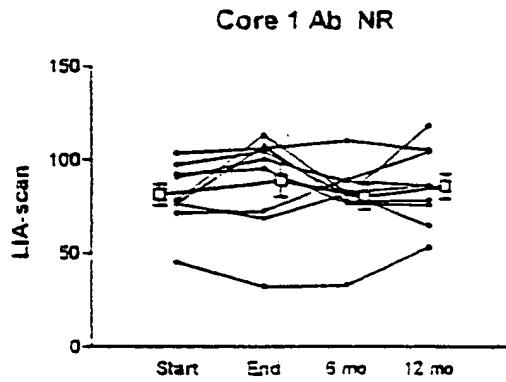


Fig. 35B-1

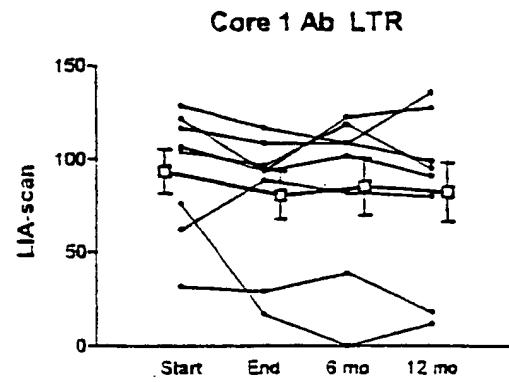


Fig. 35B-2

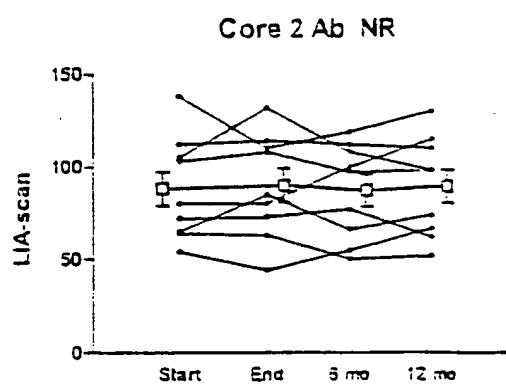


Fig. 35B-3

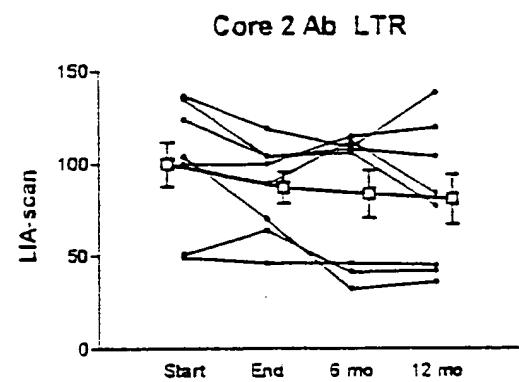


Fig. 35B-4

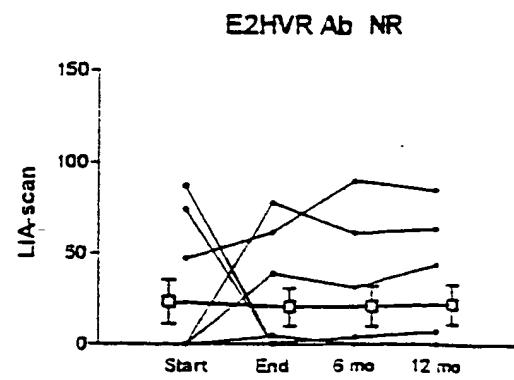


Fig. 35B-5

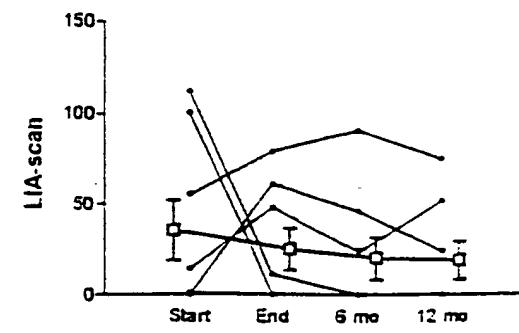


Fig. 35B-6

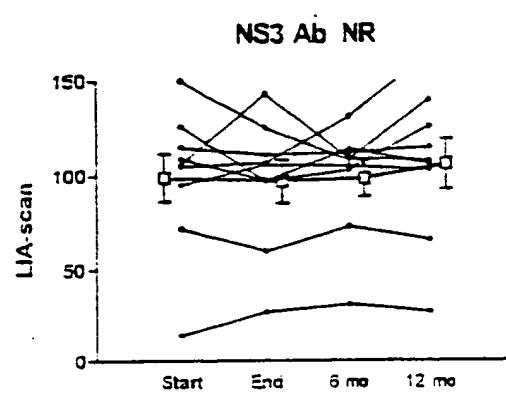


Fig. 35B-7

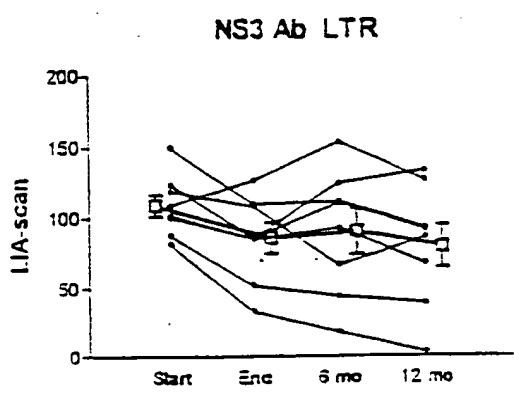


Fig. 35B-8

Fig. 36A

E1 Ab

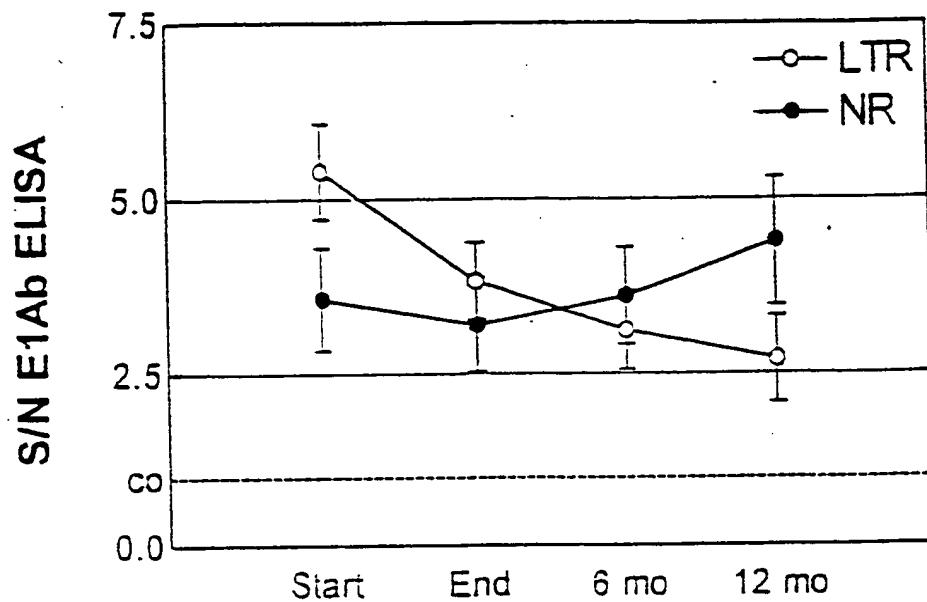


Fig. 36B

E2 Ab

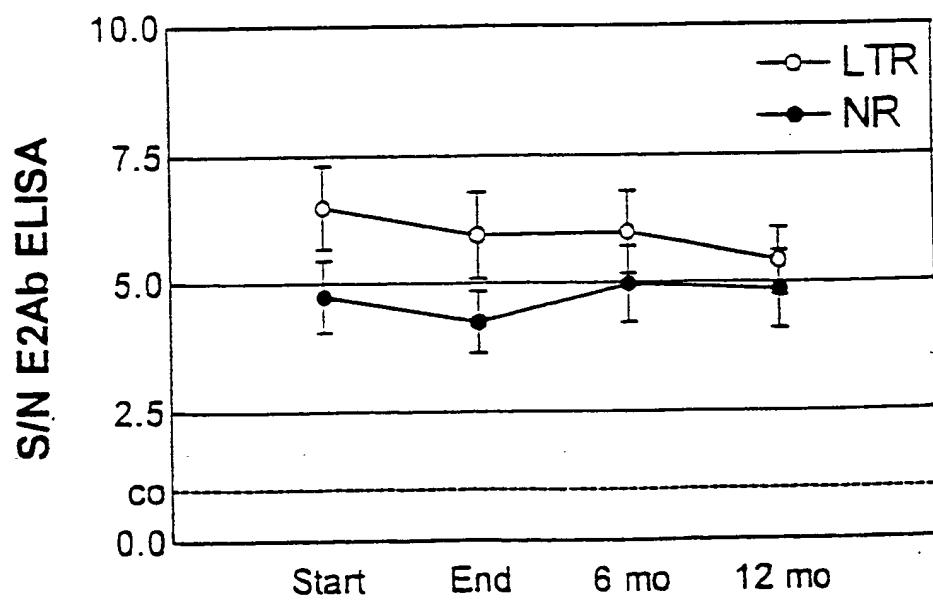


Fig. 37A
Non Responders

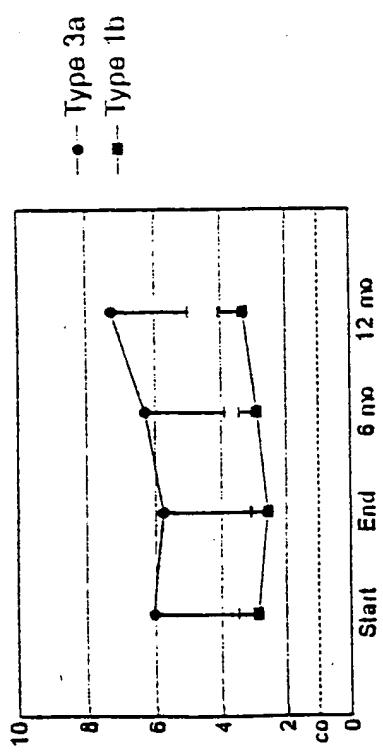


Fig. 37C
Type 1b

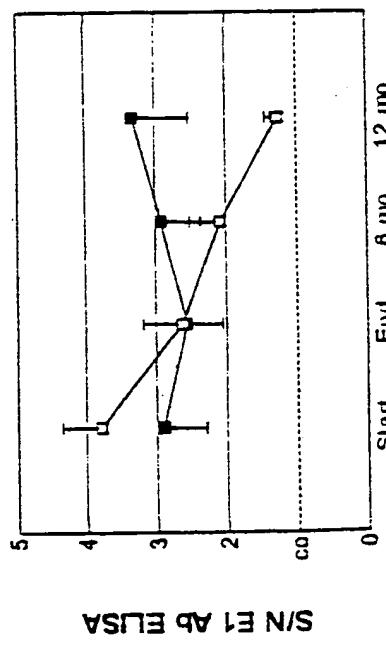


Fig. 37D
Type 3a

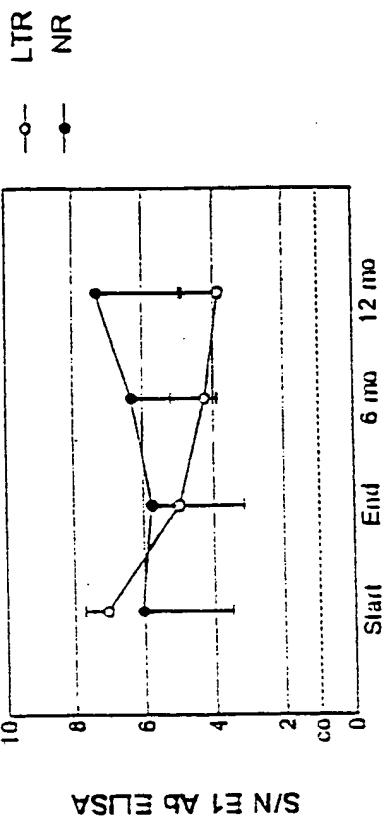


Fig. 37B
Long Term Responders

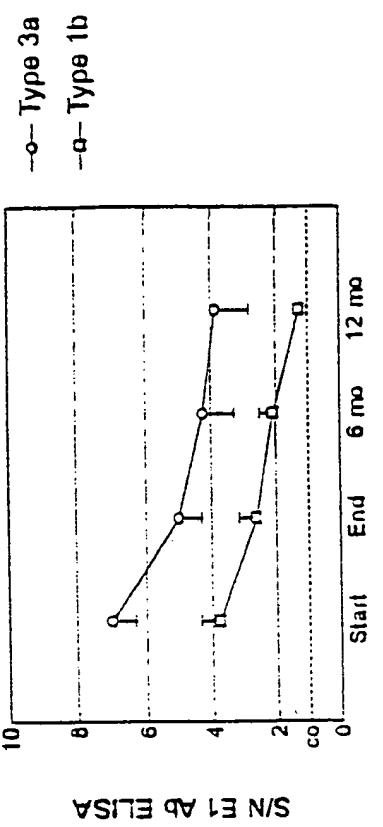
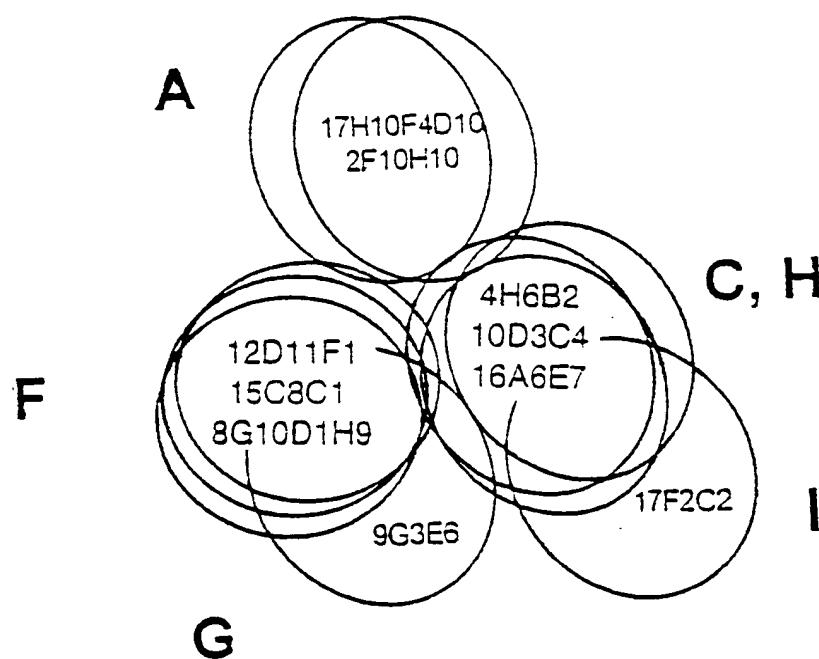


Fig. 37D
Type 3a

Fig. 38

Relative Map Positions of
anti-E2 monoclonal antibodies



PARTIAL DEGLYCOSYLATION
OF HCV E1 ENVELOPE PROTEIN

Endoglycosidase H
(Endo H) Glycopeptidase F
(PNGase F)

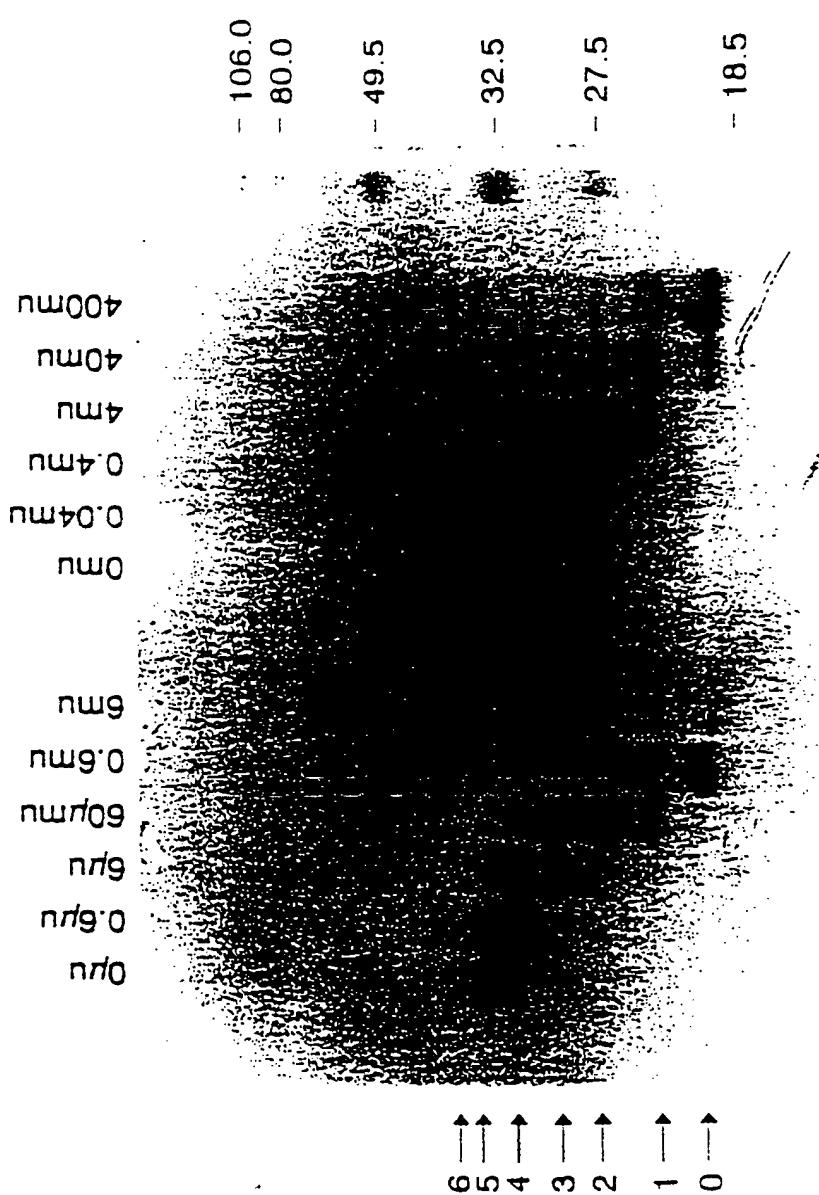


Fig. 39

PARTIAL TREATMENT OF HCV E2\|E2s ENVELOPE PROTEINS
BY PNGase F

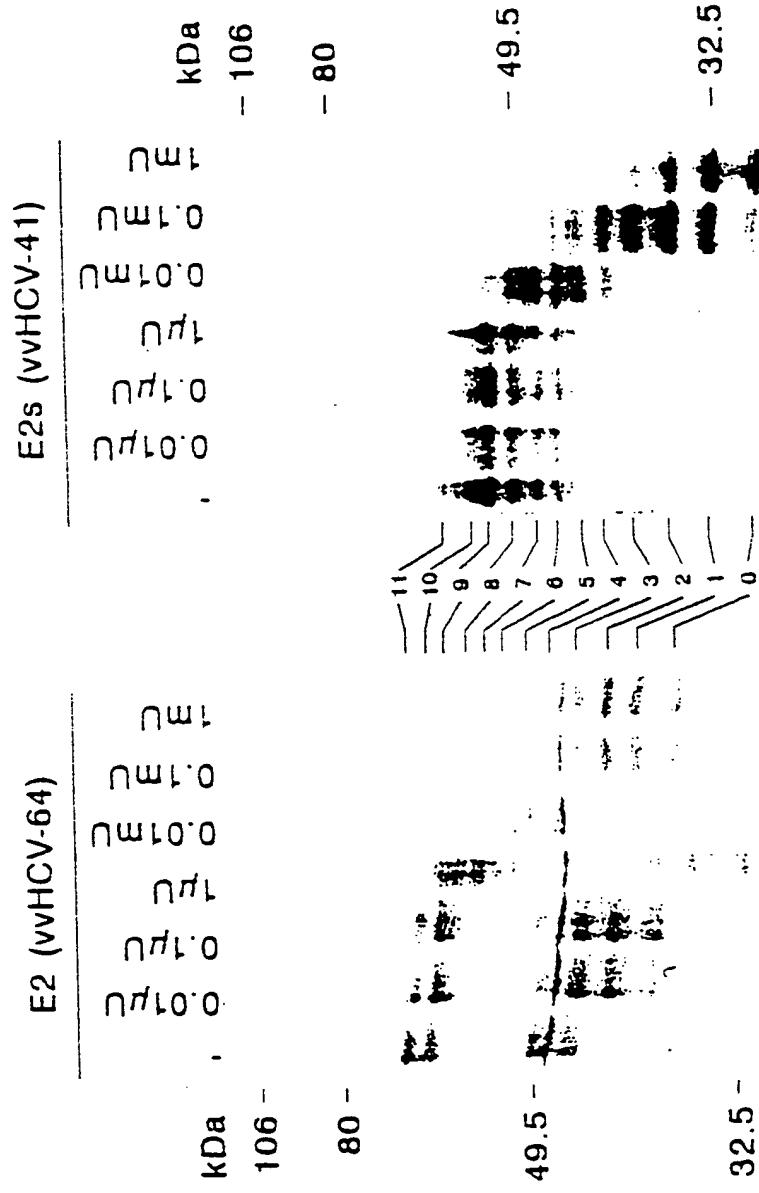


Fig. 40

Fig. 41 *In Vitro* Mutagenesis of HCV E1 glycoprotein

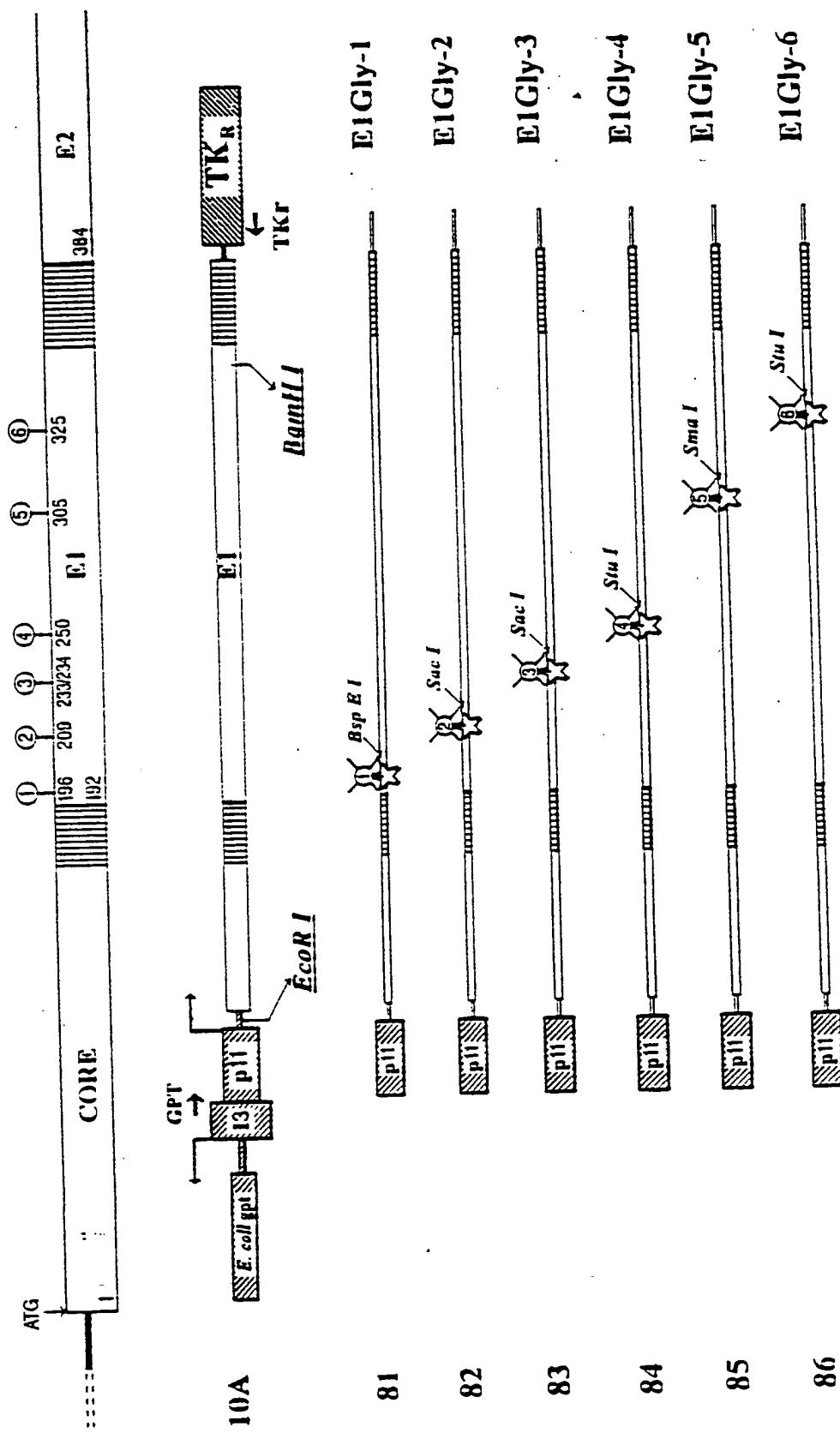
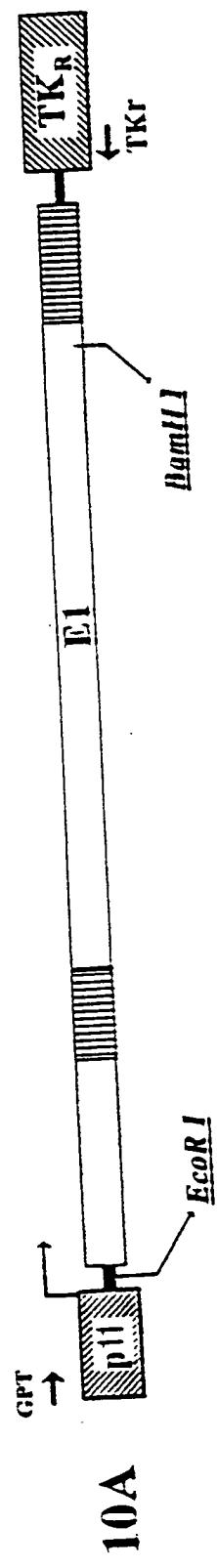
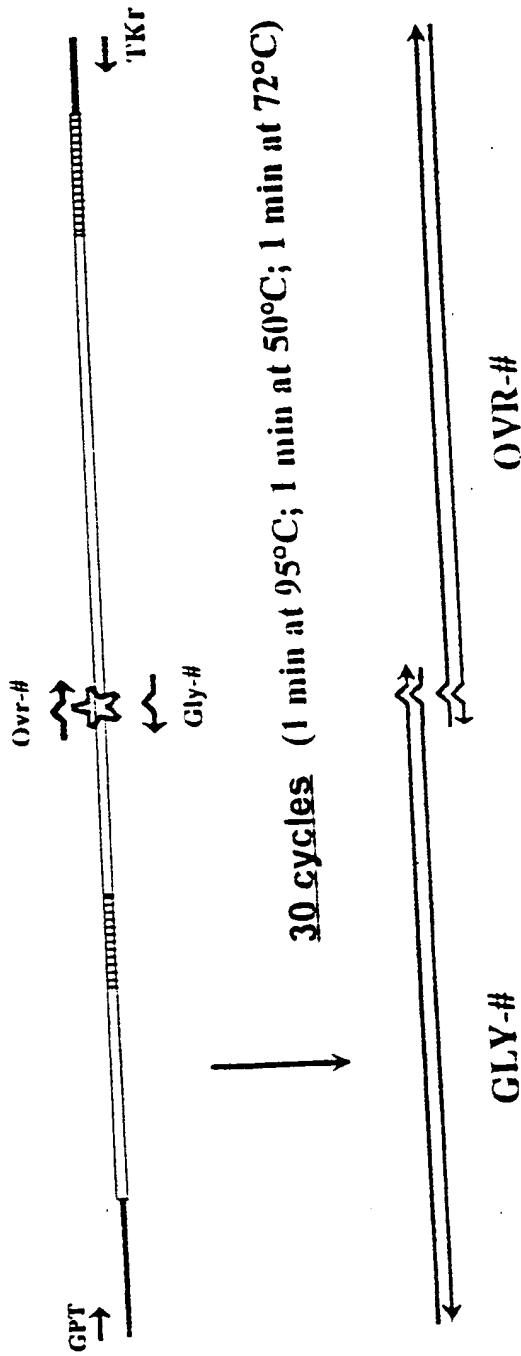


Fig. 42A *In Vitro* Mutagenesis of HCV E1 glycoprotein



1. First step of PCR amplification (Gly-# and Ovr-# primers)



2. Overlap extension and nested PCR

a. Overlap extension

Fig. 42B

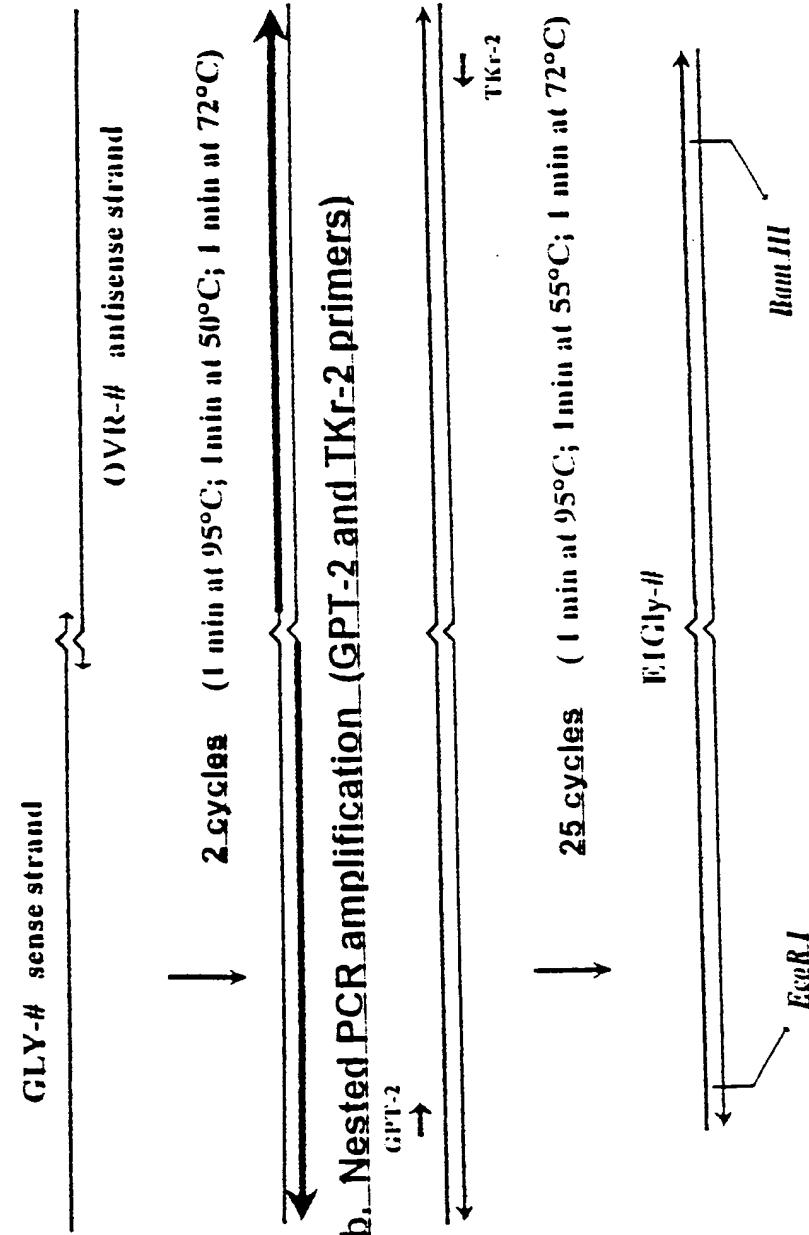
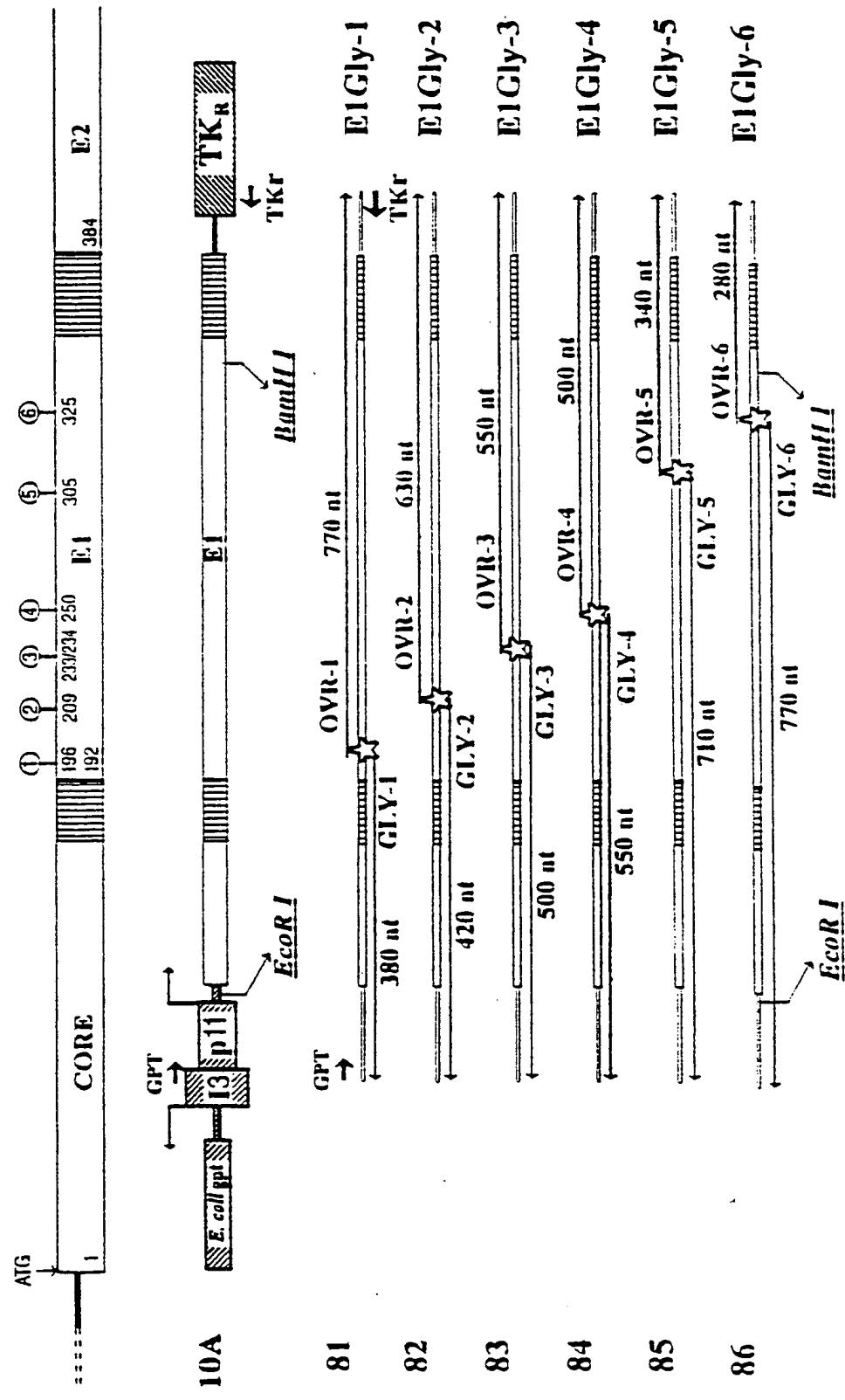


Fig. 43 *In Vitro* Mutagenesis of HCV E1 glycoprotein



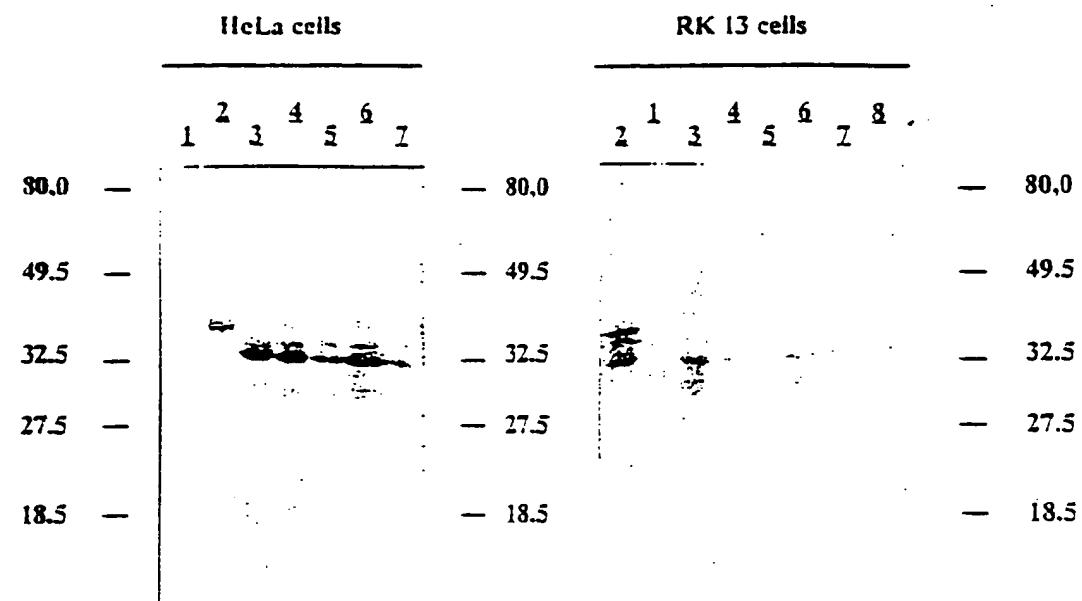


Fig. 44A

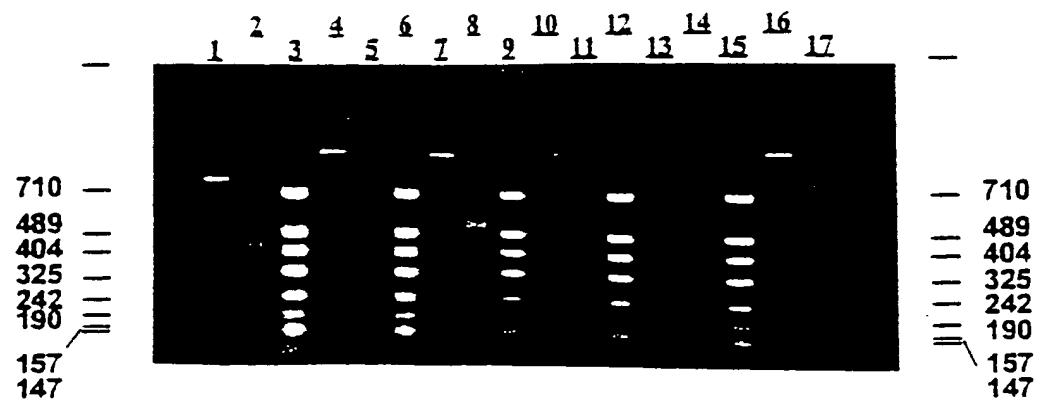


Fig. 44B

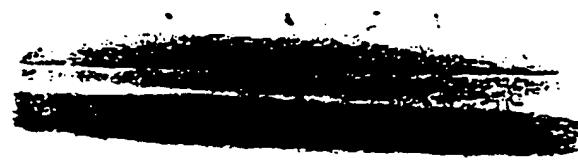


Fig.45

KDa 19 67 43 29 18
| | | | |



Fig.46

Fig. 47

	age (years)	HCV infection (years)	genotype
Marcel	17	9	1a
Peggy	21	16.5	1b
Femma	15	9	1a
Yoran	12	none	
Marti	12	none	

chronic carriers (strong T-cell adjuvant)

↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ 50 µg E1 dose

0 3 6 9 12 15 26 29 32 35 38 41 weeks

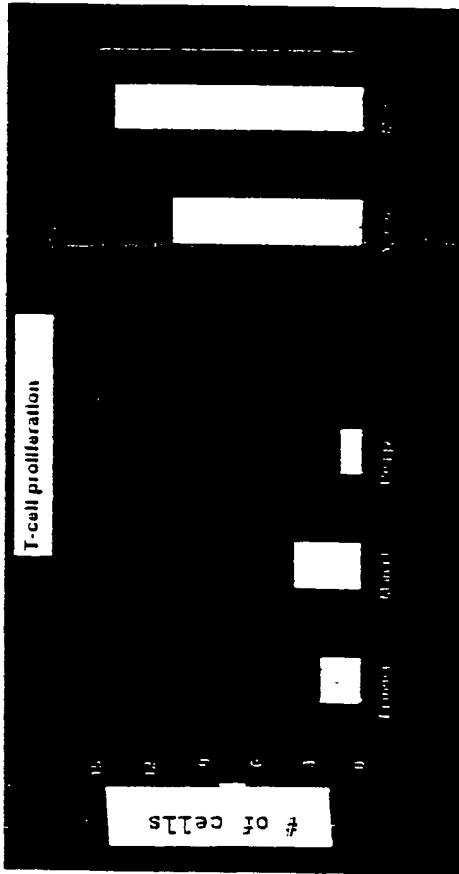
naive (alum)

↓ ↓ ↓ ↓ ↓ ↓ 50 µg E1 dose

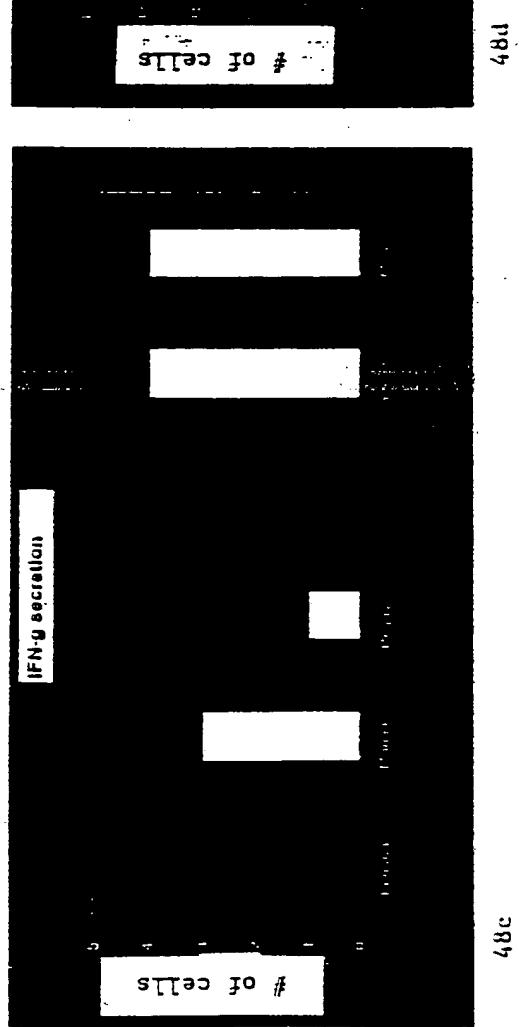
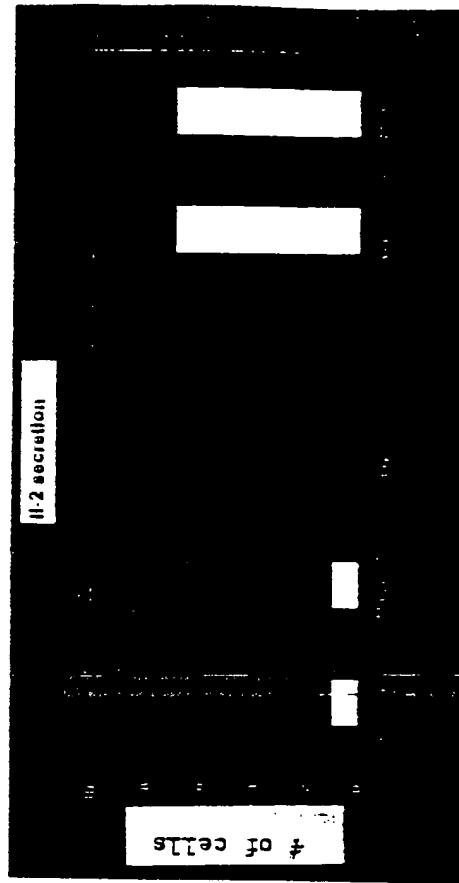
0 3 6 9 12 15 weeks

Fig.

48a

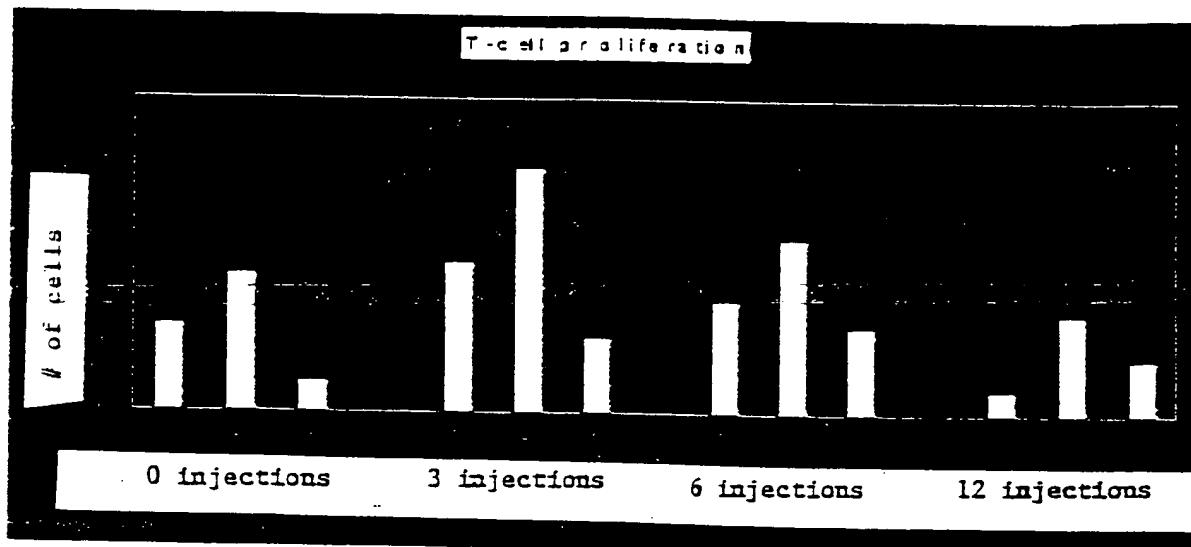


48b



48c

Fig. 49



1 Fem m a, 2 Marcel, 3 Peggy

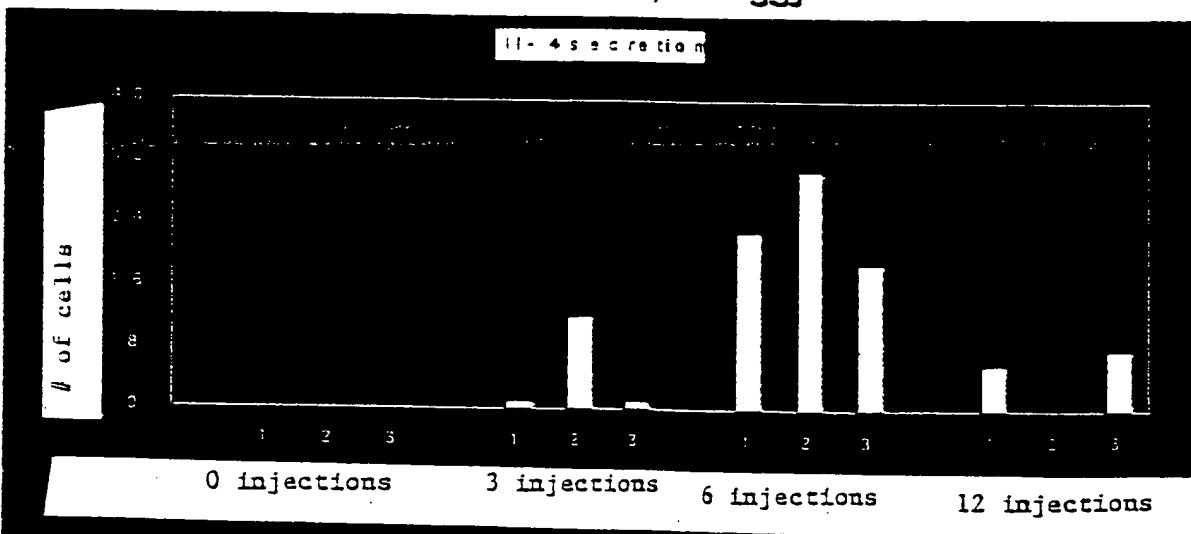
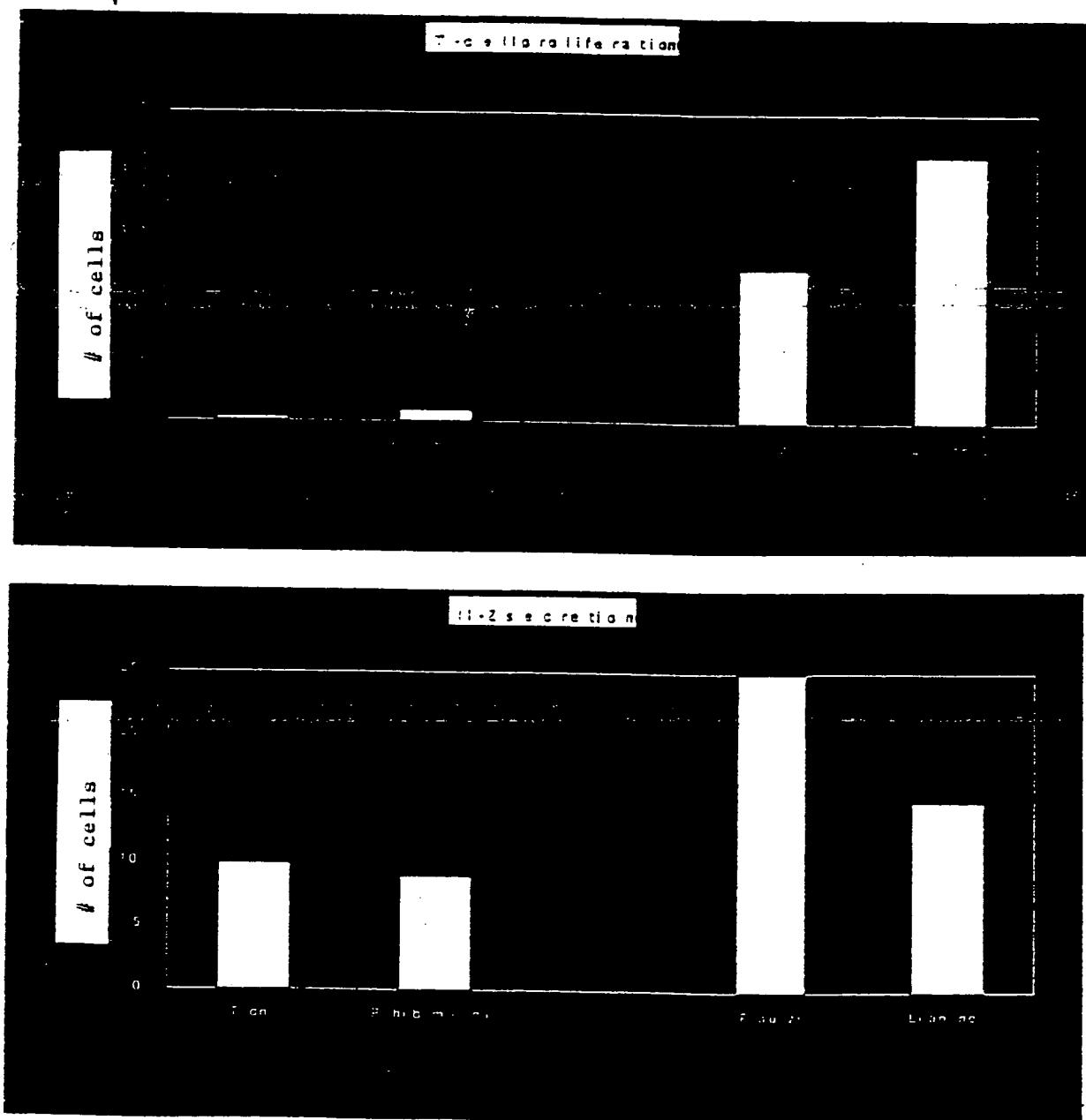


Fig. 50



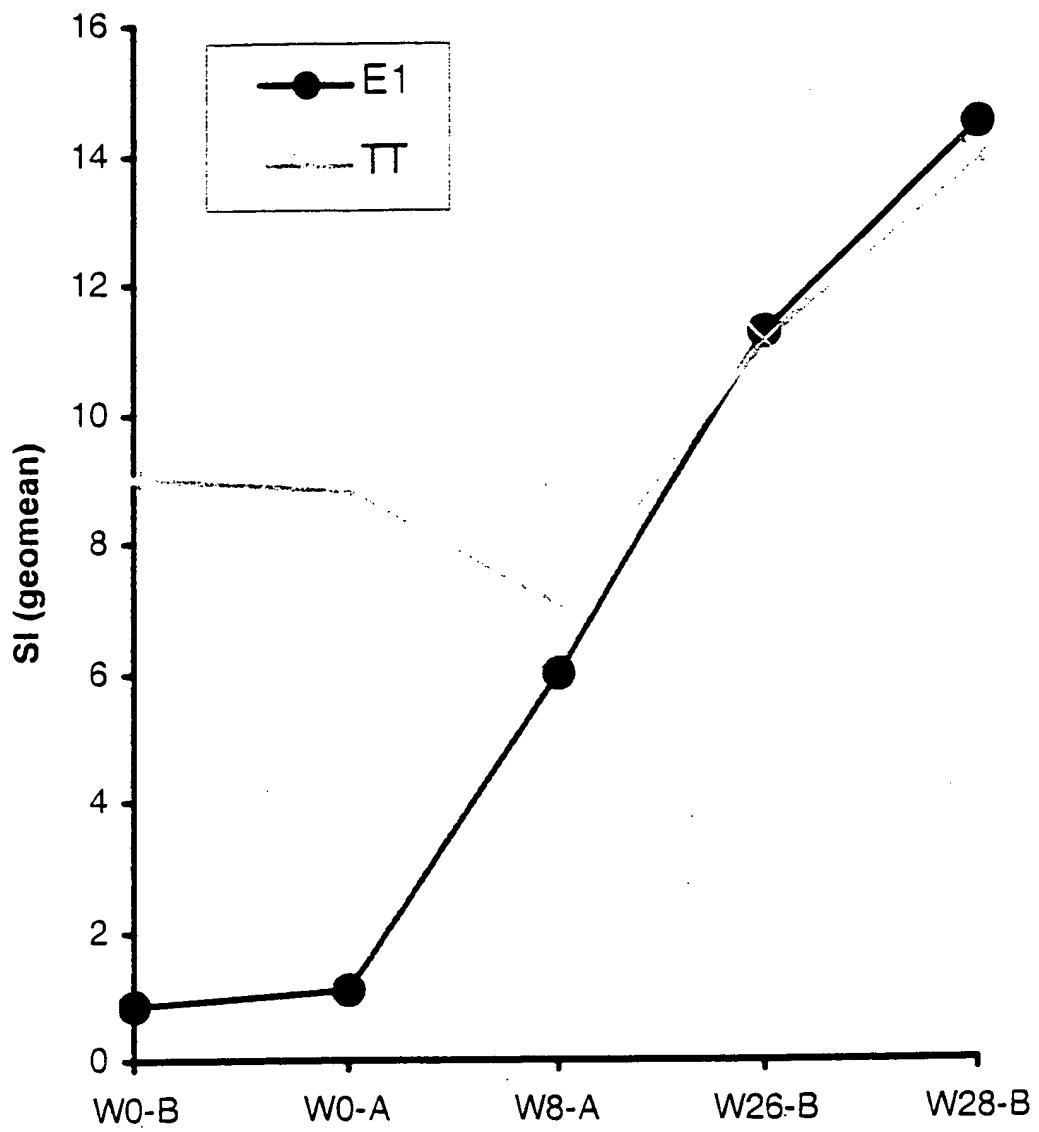


Fig 51

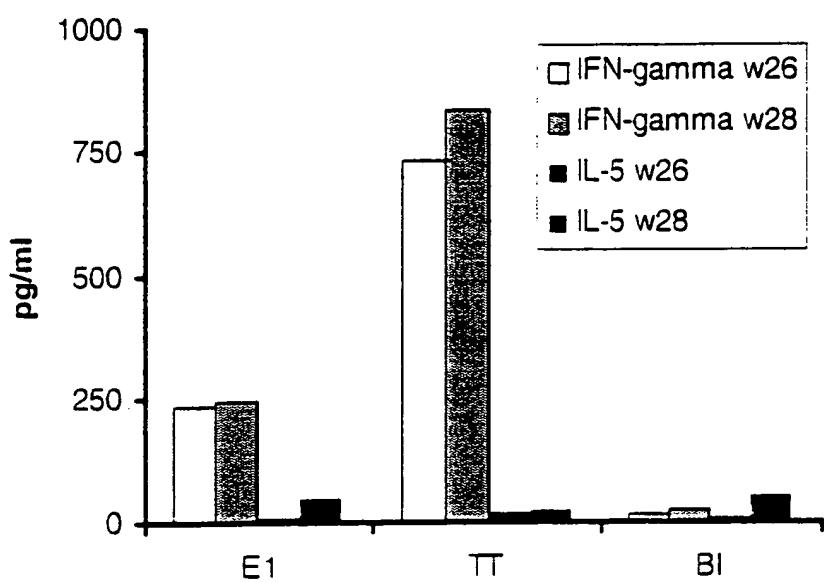
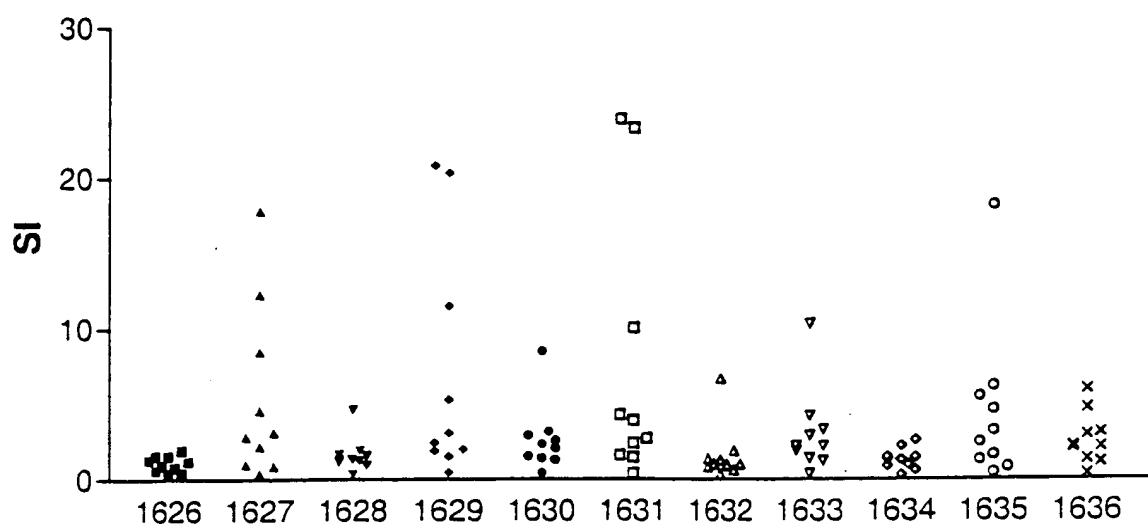


Fig 52

Fig 53

vaccinated



controls

